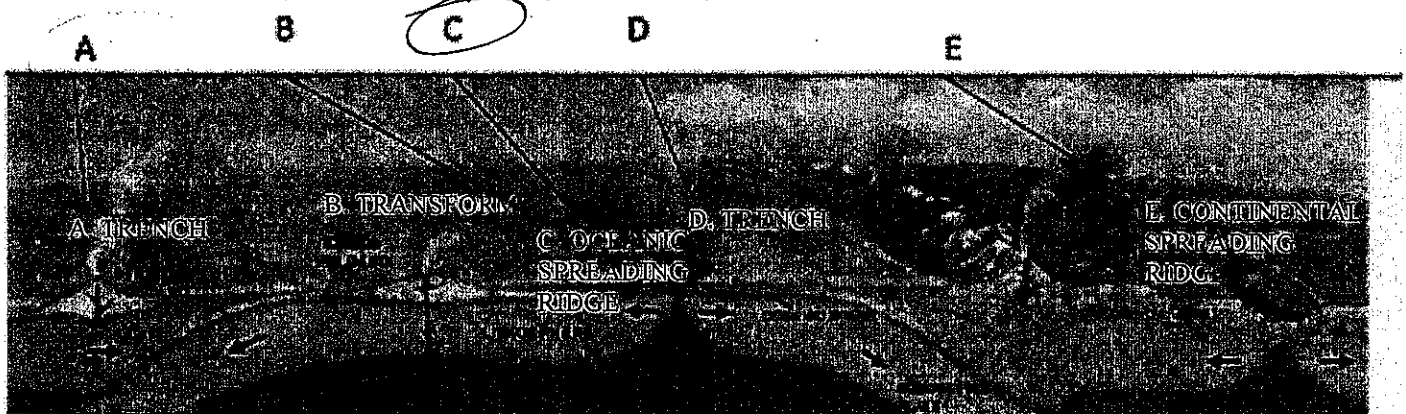


STUDENT ID #: A41694022; GROUP #: A

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, c = photosynthesis
- d. A = compaction, B = degassing, c = photosynthesis

4A. D

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
8. What type of energy drives slab pull?
- a. Gravitational energy
  - ☒ b. Thermal energy
  - c. Chemical energy
9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - ~~b. Buoyancy will occur when two materials of differing structure interact.~~
  - ~~c. Buoyancy will occur when two materials of differing phase interact.~~
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

Because magma continues to rise because it is less dense than surroundings, hot air balloon does same as hot air less dense than cold air.

- B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - ☒ b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:

Both release  $\text{CO}_2$

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Japanese earthquake was registered as being more destructive on the Richter scale, at about one point more than that of the earthquake in Haiti. Although the Japanese earthquake measured higher, the Haitian earthquake was far more destructive in terms of deaths. This is a factor of the difference between a developed and relatively underdeveloped country. The education of earthquakes and response/relief efforts are much more advanced in Japan compared to Haiti. Haiti is a poor, and has a very low literacy rate which are all factors that explain why Haiti was far more unprepared than Japan was.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy is the relative difference between the density of different materials. When examining the rising of magma and movement of the magma, buoyancy is driven by temperature change. As magma is formed it is very hot and much hotter than its surroundings. Because the magma is hotter and less dense, it begins to rise. Magma will rise and as it rises it will begin to cool, and becoming more dense. Most magma will hit a point and cool and will settle and thicken the crust, because it is no longer as buoyant which halts the rising. If magma is hot enough it can keep rising through the service, remaining less dense than its surroundings and erupt in a volcano.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

1. Built close to the shore
2. Built on a plate

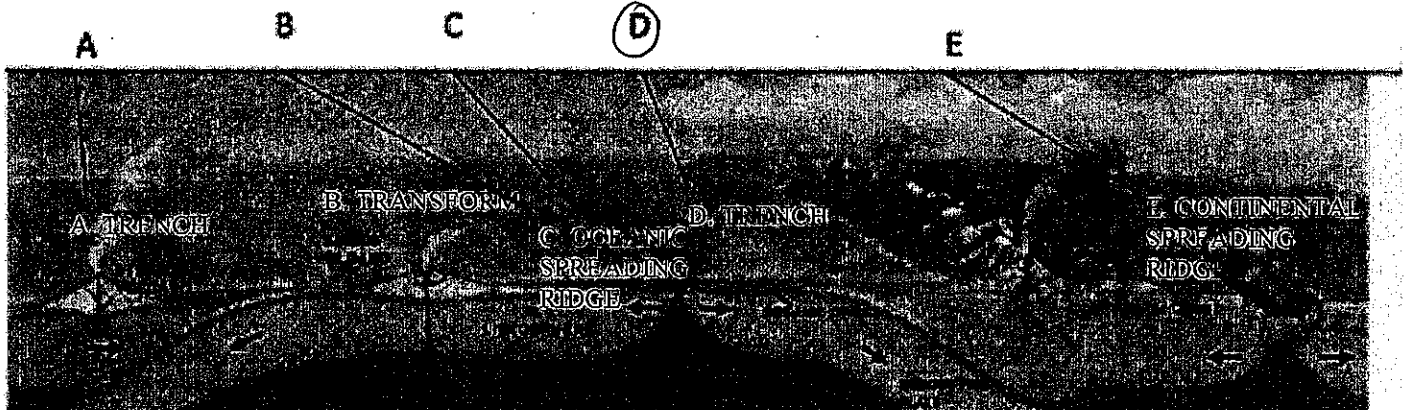


STUDENT ID #: A40706302; GROUP #: A

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?

D



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

C

- a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- ☒ c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

B

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

A

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

1A.  
C

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

C

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

A

- ☒ a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

- C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
- A 8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
- D 9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
- B 10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

A hot air balloon rises upwards because the air in the balloon is less dense than the air in the atmosphere. Similarly, the magma rises or erupts to the surface because it is less dense than the surrounding rock.

- B B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - ☒ b. Photosynthesis and burning coal
  - c. Respiration and burning coal

Please explain your response to B.:

In photosynthesis plants use carbon to create energy and with burning coal energy is created from the burning of carbon in the coal.

STUDENT ID #: A40706302; GROUP #: A

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- a. A discussion of the approximate magnitudes of each earthquake
  - b. A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Haitian earthquake was much less deadlier than the Japan earthquake for a few reasons. The magnitudes for the earthquakes would have shown the opposite effect though since the Haitian earthquake was measured at a 7 and the Japan earthquake measuring in at a 9. People in Haiti and Japan live very different lives and Haiti is much poorer. The socioeconomic factors that played a part in this were the fact that Haiti does not have any type of protection or precautions dealing with earthquakes. In Japan, people are wealthier and more prepared for a situation such as an earthquake. Houses and other buildings in Japan are built much better and better equipped to withstand an earthquake. Also, in Haiti there is less protection from earthquakes than there is in Japan. When I say protection I mean better homes, better buildings and better shelter for an earthquake. The environmental factors also played a key role in the number of deaths in each earthquake. Haiti is more jungle like with forests and less areas for protection, where Japan has more city like regions with better structures made to withstand some earthquakes. Other factors for the higher death toll in Haiti over Japan could be the people of Japan were more prepared and more planned for reacting to an earthquake in their country.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Simply put, Buoyancy is the rising of a less dense thing above something that is more dense. The most common example is that of ice floating in water. The ice floats because it is less dense than the density of liquid water. The process of magma rising is influenced by buoyancy. The magma rises because it is less dense as it melts. When magma is rising after it melts there becomes air pockets in the magma that decrease the pressure of the magma making it less dense and causing it to rise. The magma also increases in temperature making it less dense than the cooler surrounding rocks. Another example similar to that of magma is a lava lamp, the process of convection. As the lava on the bottom is heated up by the light it causes the temperature of that lava to increase and its density to decrease so that's why it rises. Once the lava gets to the top of the lamp it begins to cool down and its density increases which is why it sinks back down to the bottom of the lava lamp.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake? 1. The powerplant was not built to withstand up to a 9 magnitude earthquake.

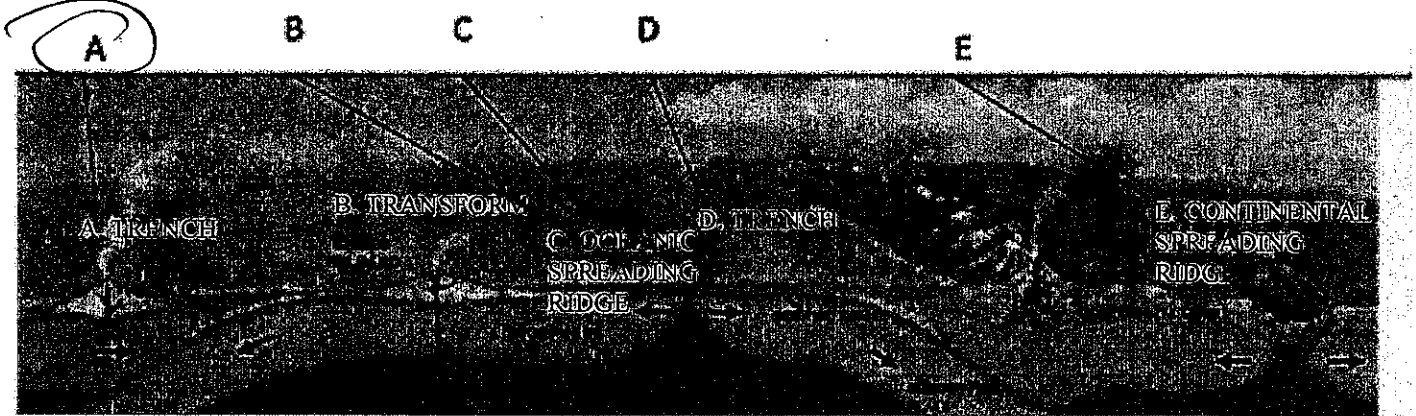
2. Some equipment/supplies inside the powerplant were old and outdated and should have been replaced in case of an earthquake.

ISP 203A: GLOBAL CHANGE  
EXAM #2; Sibley/Libarkin, Spring 2011; 100 points

STUDENT ID #: A41749376; GROUP #: A

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

4a

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5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
8. What type of energy drives slab pull?
- a. Gravitational energy
  - ☒ b. Thermal energy
  - c. Chemical energy
9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising
- b. Magma erupting and an airplane lifting off
- c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

Both the material/substance is less dense than the surrounding material which allow it to rise.

B. Which of the following are most similar?

- a. Photosynthesis and respiration
- b. Photosynthesis and burning coal
- ☒ c. Respiration and burning coal

Please explain your response to B.:

Both of the processes give off  $\text{CO}_2$  into atmosphere.

STUDENT ID #: A41749376; GROUP #: \_\_\_\_\_

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The <sup>8.9-9.0 magnitude</sup> earthquake that occurred in Japan on March 11, 2011 killed less people than the 7.0 magnitude earthquake that occurred in Haiti on January 12, 2010. This difference is best explained by the different socioeconomic and environmental factors between the two countries.

Haiti is one of the poorest countries in the world, while Japan is one of the most powerful nations of the world. Haiti, though in an area where earthquakes typically occur, cannot and did not have the proper precautions and resources to help an entire country survive a deadly earthquake. Japan on the other hand, is always prepared for natural disasters, especially earthquakes. They have money to purchase proper precautionary resources, like beracades. They also have the ability to inform the entire country, at a young age, have to deal w/ earthquakes.

Due to the shallow depth of the quake that hit Haiti, it was far more damaging than the one in Japan that occurred much deeper.

STUDENT ID #: \_\_\_\_\_; GROUP #: SP1111

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy explains how less dense materials rise when they are surrounded by more dense materials. For example, a hot air balloon will rise due ~~the~~ to buoyancy because the air inside the balloon is less dense than the surround air in the atmosphere.

As magma rises, it begins to cool, allowing some magma to solidify beneath the earth's surface. If hot enough, the magma rises more and more eventually breaking through the surface and erupting. The buoyancy changes because as magma rises towards the Earth surface, it cools, changing the buoyant force, which is allowing the magma to rise, as it cools. Buoyant forces usually force ~~the~~ less dense materials to rise, and more dense to fall.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

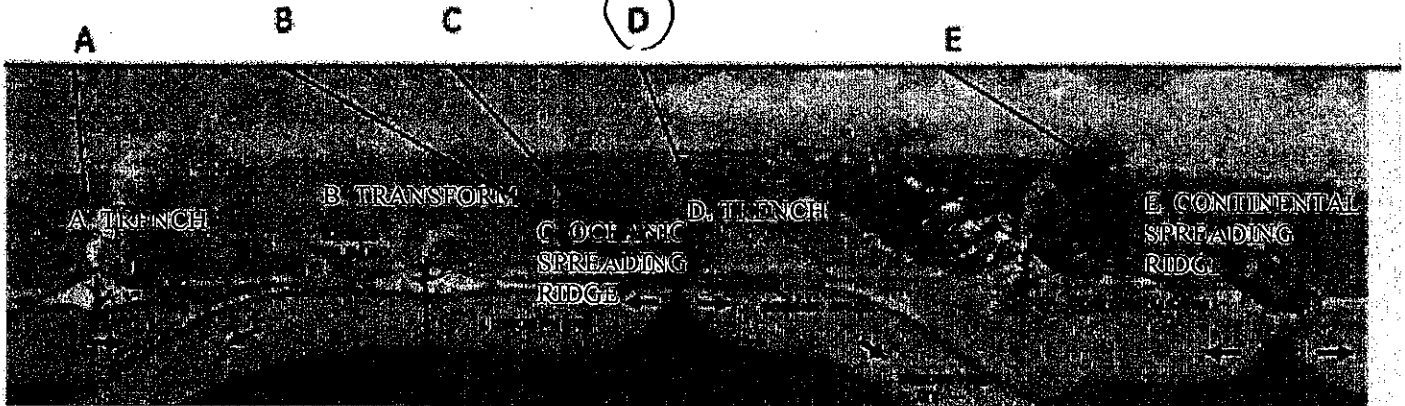
The tsunami occurred as a result of the earthquake. And the overall magnitude was too large.



STUDENT ID #: A40246306; GROUP #: A

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- D 1. At which boundary is the ocean likely to be deepest?



- B 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?
- a. Continental crust does not melt very well at convergent boundaries.
  - ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

- B 3. Which of these carries the most material in streams?
- a. Dissolved load
  - ☒ b. Suspended load
  - c. Bed load

- A 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

#1 D  
Metamorphism, uplift, weathering

- C 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - ☒ c. Continent-ocean convergent boundary

- A 6. Why do continents never subduct under oceans?
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A40246306; GROUP #: A

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- B** a. 7.0  
b. 8.0  
c. 9.0  
d. 10.0

8. What type of energy drives slab pull?

- A** a. Gravitational energy  
b. Thermal energy  
c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- D** a. Buoyancy will occur when two materials of differing temperature interact.  
b. Buoyancy will occur when two materials of differing structure interact.  
c. Buoyancy will occur when two materials of differing phase interact.  
d. Buoyancy will occur when two materials of differing density interact.  
e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- C** a. The movement of seismic waves through water  
b. The undersea displacement of water  
c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- A** a. Magma erupting and a hot air balloon rising  
b. Magma erupting and an airplane lifting off  
c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

(A) is the best answer because when magma rises it is its own temperature that does it, just like a hot air balloon, but just like when you want the balloon to land the magma stop rising as it cools off.

B. Which of the following are most similar?

- B** a. Photosynthesis and respiration  
b. Photosynthesis and burning coal  
c. Respiration and burning coal

Please explain your response to B.:

Photosynthesis & burning coal are very similar because they are both part of carbon cycle and they both represent oxidation.

STUDENT ID #: A42246306; GROUP #: A

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

While the obvious reason is the magnitude of the Haitian earthquake was a couple points larger than the recent quake in Japan, the major cause of the devastation in Haiti was their lack of preparation for such a disaster. Last week in lecture we discussed how the Japanese build their cities & buildings in preparation to withstand such tragedies, and because of that an already tragic event could have been far more devastating. In Haiti, there lack of preparation was a key factor as to why it was so devastating. The addition of the Japanese tsunami, which was caused by an under water earthquake which fractured the ocean floor causing it & the water on top to vertically rise, was a huge environmental factor that contributed to the number of tragic deaths a couple weeks ago.

STUDENT ID #: A40046306; GROUP #: A

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

As we learned from our online lectures, buoyancy has a large effect on plate tectonics & its many ideals. It is the driving force behind such wonders of our world as Mount Everest! The way buoyancy force changes as the magma rises towards the earth surface is it causes the very hot magma to go up through the lithosphere & as it does this the magma must pass through much older & colder substance which in some cases causes the magma to solidify before it can reach the surface & eventually erupt.

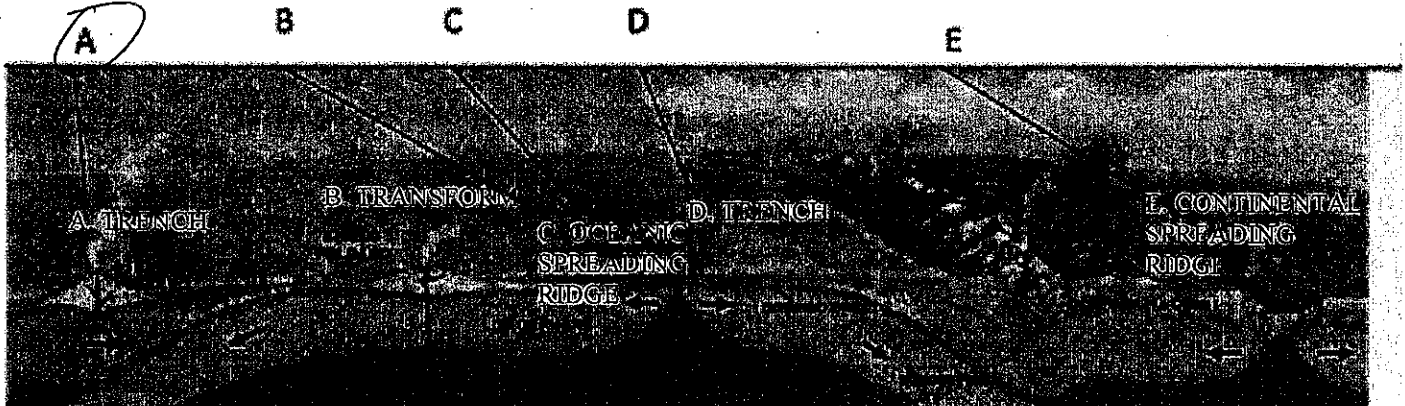
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

- 1) They did not build it high enough to withstand an earthquake of the highest magnitude.
- 2) The accumulation amount of water has forced the shut down of operation

STUDENT ID #: A43573450; GROUP #: A

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- A 1. At which boundary is the ocean likely to be deepest?



- B 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?
- a. Continental crust does not melt very well at convergent boundaries.
  - ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

- B 3. Which of these carries the most material in streams?
- a. Dissolved load
  - ☒ b. Suspended load
  - c. Bed load

- A 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- 4A. ☒ A
- ☒ a. A = compaction, B = oxidation, C = photosynthesis
  - b. A = burial, B = respiration, C = weathering
  - c. A = burial, B = oxidation, c = photosynthesis
  - d. A = compaction, B = degassing, c = photosynthesis

- C 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - ☒ c. Continent-ocean convergent boundary

- A 6. Why do continents never subduct under oceans?
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: A

- C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
- B 8. What type of energy drives slab pull?
- a. Gravitational energy
  - ☒ b. Thermal energy
  - c. Chemical energy
- D 9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
- B 10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - ☒ c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

When both happen the same sense of feeling occurs; such as ears popping or the feeling in your stomach

- B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:

Respiration and burning coal are most similar due to the fact that they both affect themselves by using their own energy through the process.

STUDENT ID #: A43573450; GROUP #: A

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

There are several reasons why more Haitians were killed than Japanese. First off the magnitudes were way different, and the Japan one was higher, but Japan being a more advanced country than Haiti was more prepared for it. When buildings were/are constructed in Japan the engineers instill a method to allow the buildings to shift with the earthquake and therefore not destroy them. Whereas for Haiti, being a poorer and less technology advanced, they were not as prepared therefore many more people died in caving buildings.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy comes into <sup>play</sup> ~~contact~~ when two items of different densities contact each other. As for why the buoyant force on rising magma changes when it rises because it comes in contact with rock and eventually water, which both respectfully have different densities. As the magma rises, it also gets displaced at times due to the buoyant forces.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

since nuclear power plants have hazards there are some precautions that should be taken but just can't due to the unplanned occassions.



STUDENT ID #: A34963430; GROUP #: B

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?

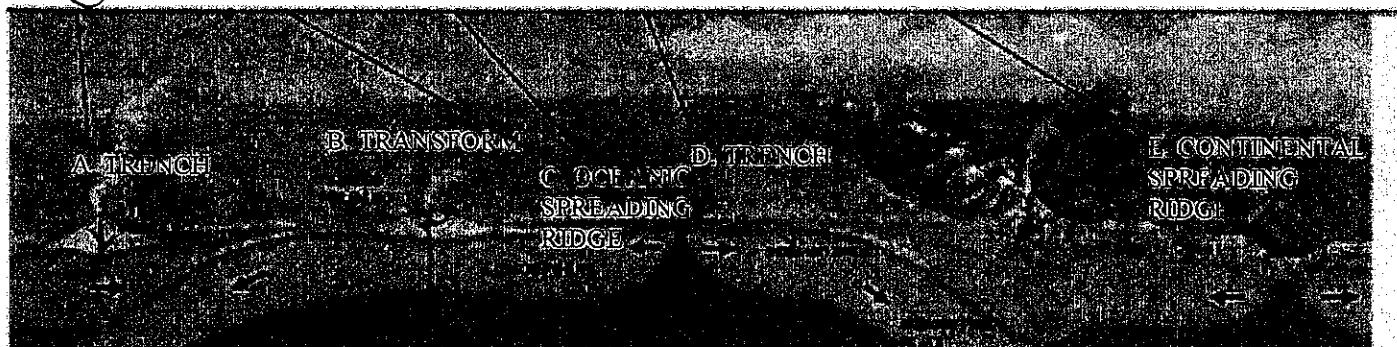
(A)

B

C

D

E



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- (b) Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

4a) A

- crystallization  
- uplift  
- transportation

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- (c) Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- a. Continental rocks are less dense than oceanic rocks.
- x Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- a. 7.0
- b. 8.0
- ☒ c. 9.0
- d. 10.0

8. What type of energy drives slab pull?

- ☒ a. Gravitational energy
- b. Thermal energy
- c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- a. Buoyancy will occur when two materials of differing temperature interact.
- b. Buoyancy will occur when two materials of differing structure interact.
- c. Buoyancy will occur when two materials of differing phase interact.
- ☒ d. Buoyancy will occur when two materials of differing density interact.
- e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- a. The movement of seismic waves through water
- ☒ b. The undersea displacement of water
- c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

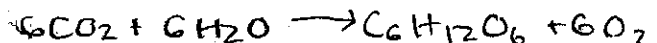
- ☒ a. Magma erupting and a hot air balloon rising
- b. Magma erupting and an airplane lifting off
- c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
magma rises/erupts due to the fact that it is less dense than the surrounding material. similarly, a hot air balloon rises higher into the atmosphere as it becomes less dense than the surrounding atmosphere.

B. Which of the following are most similar?

- a. Photosynthesis and respiration
- ☒ b. Photosynthesis and burning coal
- c. Respiration and burning coal

Please explain your response to B.:  
Burning coal and the process of respiration both are releasing CO<sub>2</sub> into the atmosphere. photosynthesis is the process of making food using sunlight whereas respiration is a release of this energy.



STUDENT ID #: A39963430; GROUP #: AB

SHORT ANSWER. 25 points each (50 points total)

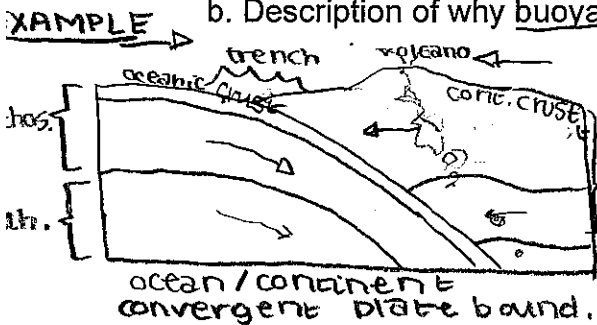
1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Haitian Earthquake was approximately a 7.0 magnitude earthquake compared to the Japan Earthquake of 9.0 magnitude. In Haiti, however, there was a greater amount of death and destruction due to their infrastructure and the way it was built. Unlike Japan, the buildings in Haiti were constructed out of cement in order to withstand the effects of hurricanes. Japan, which sits at a different plate boundaries, in particular the North American/Pacific <sup>convergent</sup> boundary (a hotspot for earthquakes and tsunamis) has constructed buildings to withstand the possible earthquakes that are likely to occur in this area. These particular factors led to a greater amount of deaths in Haiti. The death toll for the earthquake in Japan, however is still estimated at 10,000 proving it was a major natural disaster and is now the 7th largest Earthquake in Japan's history.

STUDENT ID #: 911; GROUP #: 2505JFPA

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.



Buoyancy is responsible for the movement and change of matter in not only oceans and atmospheres but for materials in earth's surface as well.

Buoyancy will occur when material of different densities interact. As indicated in the diagram above, oceanic plates which are cooler and more dense (basalt) than continental plates (granite) are subducted beneath continental plates due to gravitational forces. As the plate sinks deeper into the mantle, the rock can begin to melt due to changes in temperature, composition, and pressure. The rock often is exposed to water that is squeezed out of the rock due to pressure and chemically changes the rock causing it to melt. When the rock melts and becomes magma, it rises towards the surface due to buoyant forces → the magma is now less dense than the surrounding material. According to Archimedes' principle, the buoyant force is equivalent to the weight of the displaced rock. As the magma rises higher towards the earth's surface, it cools and spreads beneath the crust - a major cause of the movement of tectonic plates. Sometimes, the magma is hot enough that it will rise up out through the crust/expand which causes an eruption. If not, the cooling magma that is now denser than the surrounding material will sink again due to buoyant forces. This entire process is what we call the convection cycle.

gravitational

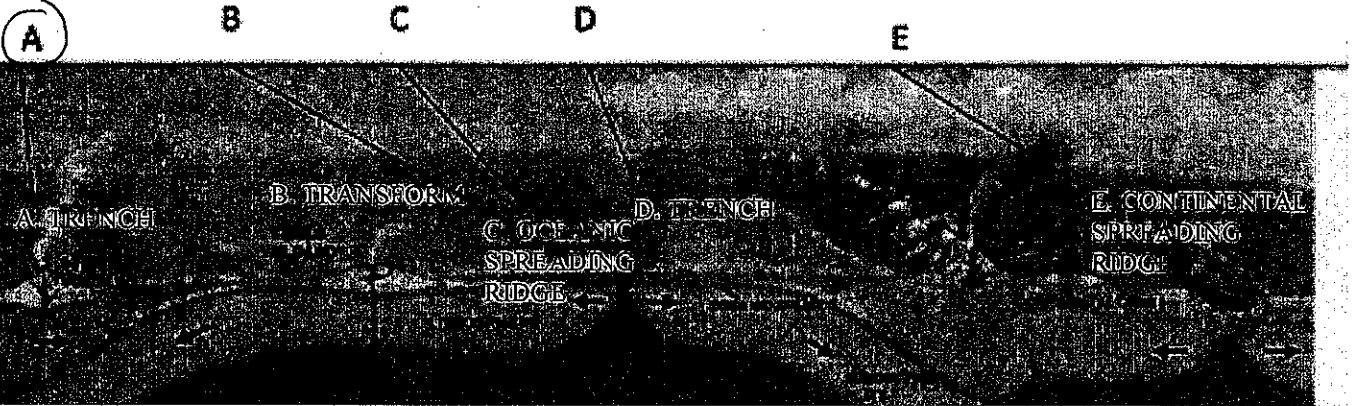
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

- They are only built to withstand a 7.9 magnitude earthquake
- The pipes in the nuclear powerplants were exposed to water from the tsunami which increased melting resulting in a failure to withstand → there was also a loss of electricity

STUDENT ID #: A43979706; GROUP #: B

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- ☒ a. Continental crust does not melt very well at convergent boundaries.  
☐ b. Continental crust is so thick that melt cools before it reaches the surface.  
☐ c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- ☐ a. Dissolved load  
☒ b. Suspended load  
☐ c. Bed load

4a | D

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis  
☐ b. A = burial, B = respiration, C = weathering  
☐ c. A = burial, B = oxidation, c = photosynthesis  
☐ d. A = compaction, B = degassing, c = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- ☐ a. Ocean-continent transform boundary  
☐ b. Ocean-ocean divergent boundary  
☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.  
☐ b. Oceanic rocks are less dense than continental rocks.  
☐ c. Continental rocks are warmer than oceanic rocks.  
☐ d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- C  
a. 7.0  
b. 8.0  
c. 9.0  
d. 10.0

8. What type of energy drives slab pull?

- A  
a. Gravitational energy  
b. Thermal energy  
c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- D  
a. Buoyancy will occur when two materials of differing temperature interact.  
b. Buoyancy will occur when two materials of differing structure interact.  
c. Buoyancy will occur when two materials of differing phase interact.  
d. Buoyancy will occur when two materials of differing density interact.  
e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- B  
a. The movement of seismic waves through water  
b. The undersea displacement of water  
c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- A  
a. Magma erupting and a hot air balloon rising  
b. Magma erupting and an airplane lifting off  
c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

magma rises due to a change in density  
as does the air in a hot air balloon  
rises due to thermal energy  
lifting the balloon

C B. Which of the following are most similar?

- a. Photosynthesis and respiration  
b. Photosynthesis and burning coal  
c. Respiration and burning coal

Please explain your response to B.:

Both of these processes  
release carbon into the  
atmosphere as a chemical  
change. Carbon dioxide

STUDENT ID #: A43979206; GROUP #: B

SHORT ANSWER. 25 points each (50 points total)

Haiti: 7  
Japan: 9

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

One of the main reasons the Earthquake in Japan was much less devastating than to those in the Haitian earthquake was due to the preparedness of both countries. In Haiti, the earthquake weighed in with a magnitude of about 7, and in Japan the shift in plates caused a magnitude of approximately 9. Since Haiti had mostly only dealt with hurricanes in the past, the country was not prepared for such a devastating earthquake. Japan is also much more financially secure and could afford aid and evacuation to those effected much more promptly. The death toll in Haiti increased daily due to the lack of ability to evacuate and care for survivors, whereas in Japan, these needs were tended to more appropriately.

STUDENT ID #:

GROUP #:

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy occurs when 2 objects interact with different densities causing a shift in placement.

Buoyancy changes as magma reaches the earth's surface because a change in temperature occurs as it rises. At the source of the magma in the lithosphere melts rock from boiling water ~~again~~ in an oceanic-continent convergence causing hot molten rock to rise. This occurs due to thermal energy changing the composition of the rock to a liquid. As the magma rises, the molten rock begins to cool, and causing its density to increase. If the magma's density increases enough to cool and stop the rock, the magma will dry and harden, sometimes causing fractures in the lithosphere. If its density stays above the density of the surrounding earth, the magma will erupt through the earth's surface creating a volcano.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

Heavy movement  
of  
tectonic plate

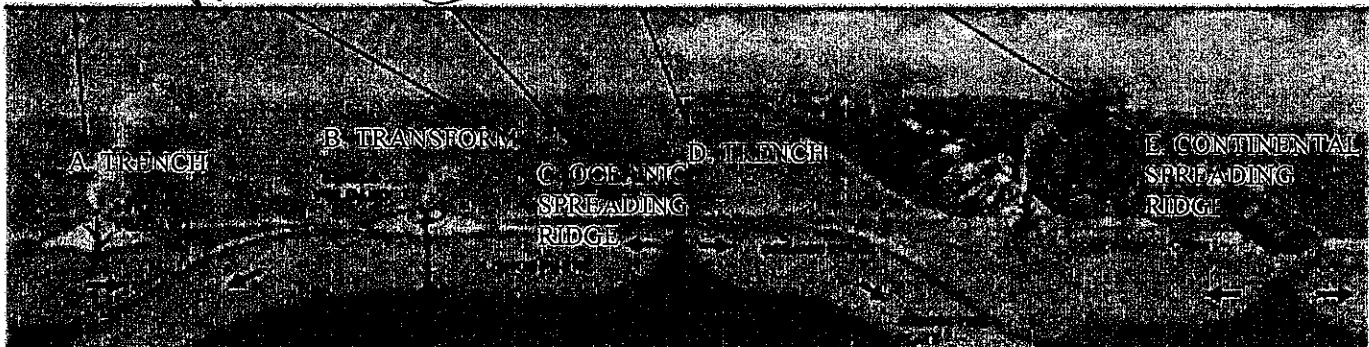
Unstable  
location



STUDENT ID #: A40290629; GROUP #: B

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- b. Suspended load
- c. Bed load

Question 4a  
D metamorphism  
- uplift  
- weathering

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

- C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
- A 8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
- D 9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
- B 10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A:  
Densities are interacting, causing the lesser density to be pushed up & the more dense to sink down. Magma erupting is less dense than surrounding rock, air in balloon is less dense than air outside.

- B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B:  
Both are releasing carbon into the air.

STUDENT ID #: A40290629; GROUP #: B

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The main reason that Japan's earthquake killed fewer people, was because their buildings were designed to stand strong <sup>even</sup> during earthquakes. Haitian infrastructure was made out of concrete because their biggest fear was hurricanes. Instead, this backfired on them when the earthquake occurred on Jan. 12, 2010. Japan's earthquake was a magnitude of 9, which was stronger than Haiti's which was roughly a magnitude of 7. Most of Japan's buildings are built on springs, which are located underneath the buildings. Their buildings were specialized to withstand earthquakes and Japan has a higher socioeconomic standing, compared to Haiti. The concrete buildings in Haiti killed more people, then helped them and were not prepared for this natural disaster, however, Japan was prepared.

STUDENT ID #:

GROUP #:

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

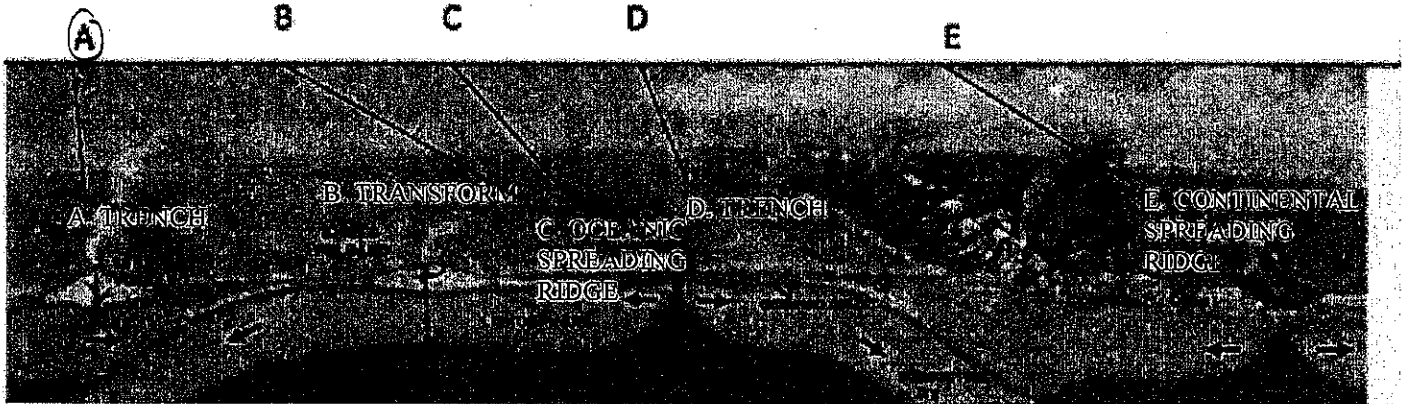
When magma initially starts out, it is heated up, which makes the magma less dense and move to the earth's surface. It is less dense than the material surrounding, so it's pushed up. The interaction of the two densities are causing the less dense material to be pushed up, causing the more dense material to sink down. Once hot magma is moving toward the earth's surface, it eventually cools off and sinks back down. Buoyancy changes due to temperature in this case.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

STUDENT ID #: A1427284; GROUP #: B

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- A 1. At which boundary is the ocean likely to be deepest?



- B 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?
- a. Continental crust does not melt very well at convergent boundaries.
  - ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

- B 3. Which of these carries the most material in streams?
- a. Dissolved load
  - ☒ b. Suspended load
  - c. Bed load

- A 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

Question 4A: D

- C 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - ☒ c. Continent-ocean convergent boundary

- A 6. Why do continents never subduct under oceans?
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A11427286; GROUP #: B

- C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
- A 8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
- D 9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
- A 10. Which of the following can cause a tsunami?
- ☒ a. The movement of seismic waves through water
  - b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
They are the most similar because magma gets warmer and rises just as a hot air balloon rises when heat is placed into the balloon.

- C B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:

STUDENT ID #: A41427286; GROUP #: B

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The earthquake in Japan had a magnitude of approximately 9.0. Even though many of the Japanese buildings were not made to withstand an earthquake that large, the citizens of Japan were more prepared for a natural disaster. They had had more training and education on what to do in case of a natural disaster.

STUDENT ID #: A41427286; GROUP #: B

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyant forces on rising magma change as the magma rises because buoyancy is effected by density. As the magma rises towards the Earth's surface it gets cooler. When the magma begins to cool down it becomes more dense. As the magma becomes more dense, it becomes less buoyant.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

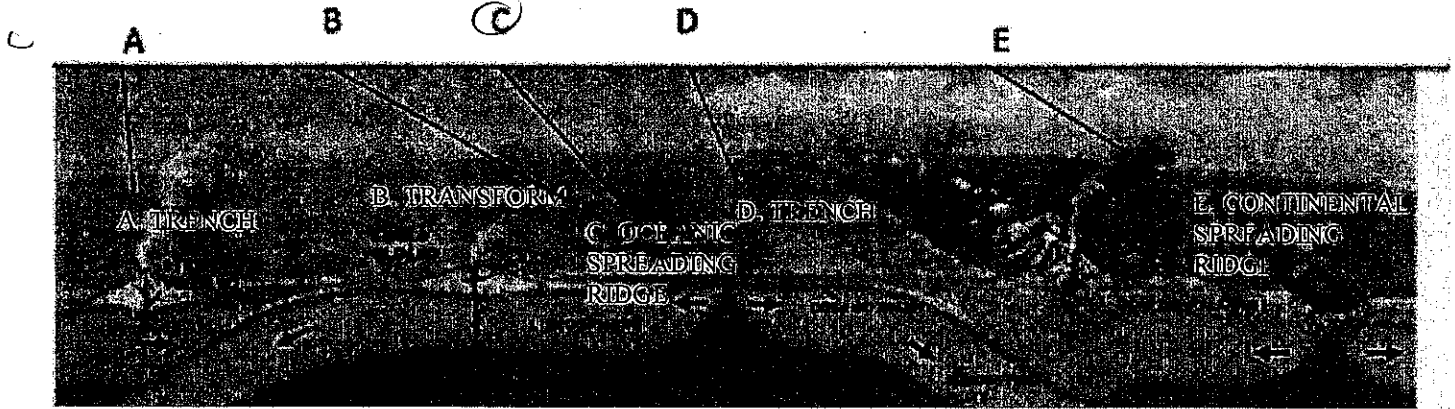
One reason is because the buildings were not made to withstand an Earthquake that large. They were made for an Earthquake measuring in at 7.2.



STUDENT ID #: A42483118 [REDACTED] GROUP #: C

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

Ha. D

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?  
C ☐ a. 7.0  
☐ b. 8.0  
☒ c. 9.0  
☐ d. 10.0
8. What type of energy drives slab pull?  
A ☒ a. Gravitational energy  
☐ b. Thermal energy  
☐ c. Chemical energy
9. Which of the following is the most general correct explanation of buoyancy?  
D ☐ a. Buoyancy will occur when two materials of differing temperature interact.  
☐ b. Buoyancy will occur when two materials of differing structure interact.  
☐ c. Buoyancy will occur when two materials of differing phase interact.  
☒ d. Buoyancy will occur when two materials of differing density interact.  
☐ e. Buoyancy will occur when two materials of differing composition interact.
10. Which of the following can cause a tsunami?  
B ☐ a. The movement of seismic waves through water  
☒ b. The undersea displacement of water  
☐ c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?  
A ☒ a. Magma erupting and a hot air balloon rising  
☐ b. Magma erupting and an airplane lifting off  
☐ c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

Both magma and the hot air balloon rise because magma and the hot air within the balloon are less dense than surrounding material. For magma it is less dense than the rock material of the lithosphere and for hot air balloons the hot air is less dense than surrounding air of atmosphere.

- B. Which of the following are most similar?  
C ☐ a. Photosynthesis and respiration  
☐ b. Photosynthesis and burning coal  
☒ c. Respiration and burning coal

Please explain your response to B.:

CO<sub>2</sub> is a byproduct of both processes.

STUDENT ID #: A42483118 ; GROUP #: C

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

On the moment magnitude scale, the Haitian earthquake registered as a 7 magnitude while Japan was registered at about an 8.9 to 9.0 magnitude. The most severe earthquakes happen at convergent boundaries because earthquakes happen deeper under earth's surface. Earthquakes are the release of energy due to the build up of tension caused by the friction between two plates at a fault line. Thus, at a convergent boundary, due to subduction, earthquakes can be stronger and more severe on a moment magnitude scale. However, a less severe magnitude such as Haiti on the moment magnitude scale can ~~have~~ place higher on the other scale (forgot name) that measures the severity of resulting damage. Socioeconomic and environmental factors that contribute to the relative difference in death tolls can be, but are not limited to, the level of preparation and planning if a disaster as such would occur, architecture and building codes - if buildings are built to withstand severity. Japan is wealthier and more industrial than Haiti giving it an edge in providing medical attention to citizens as well as probably providing better quality displacement programs. Also the location of highly populated areas and the disaster can affect death tolls. The response of governments - thus a more stable government would have better response.

STUDENT ID #:

GROUP #:

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy, as stated in question 1, will occur when two materials of differing densities interact. The buoyant force is a result of the difference of densities of these two materials. Thus, the larger the difference the stronger the buoyant force. The buoyant force is not static, however, because <sup>the</sup> density of materials can change. A change in composition, temperature, or pressure can result in a change in a material's density. In terms of rising magma, the process begins at a continent-ocean convergent point. Water escapes from the subducting oceanic lithosphere and is added to the overlying mantle of the continental crust causing hydration melting of the rock. The rock material then becomes magma. The magma is then less dense than surrounding material and it rises upward using its heat to deform the rock allowing for the magma to continue upward. But in its continued journey upward through the continental lithosphere, the buoyant force decreases because heat is being transferred to the rocks. According to the causal principle, as ~~density~~ temperature increases, for most materials density will decrease. At this point, rising magma is doing the opposite, temperature is decreasing so it is gradually becoming more dense. So the buoyant force is decreasing. One possibility is that magma's density will eventually equal the surrounding material leading to crystallization of the magma within the lithosphere. The buoyant force would then be zero. Another possibility is that the buoyant force remains in favor of the rising magma's journey upward leading to a volcanic eruption. The relationship between a decrease in the containing pressure of the rock and the vapor pressure of the gas bubbles within the magma contribute to the upward momentum and eruption and higher buoyant force.

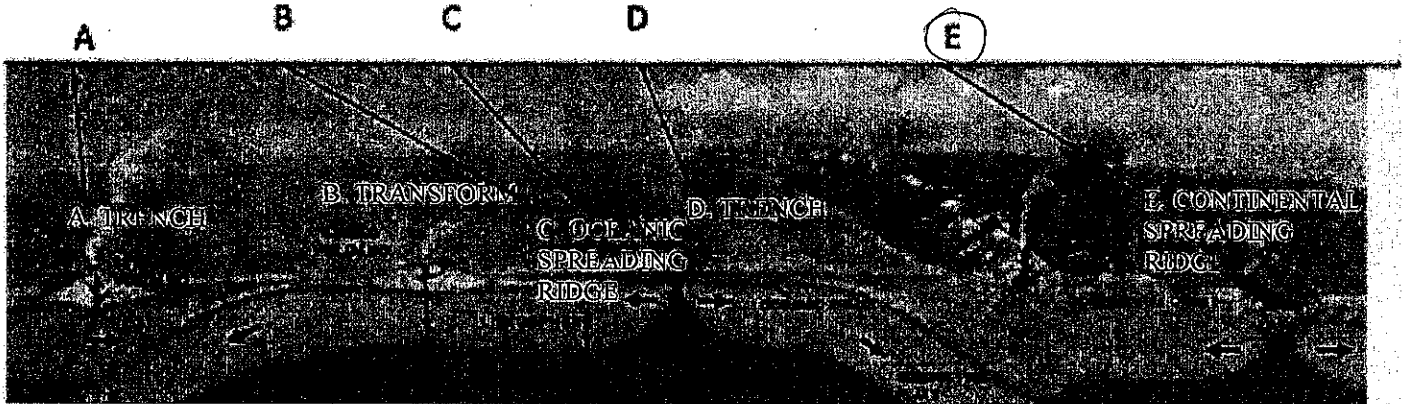
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

- It wasn't built to withstand this severe of an earthquake.
- ~~After~~ Damages done to the plant complicated procedures to prevent leaks in the event of a tsunami.

STUDENT ID #: A42226052, [REDACTED] GROUP #: C

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- E 1. At which boundary is the ocean likely to be deepest?



- B 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?
- a. Continental crust does not melt very well at convergent boundaries.
  - ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

- B 3. Which of these carries the most material in streams?
- a. Dissolved load
  - ☒ b. Suspended load
  - c. Bed load

- A 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

4a. D

- A 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?
- ☒ a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - c. Continent-ocean convergent boundary

- A 6. Why do continents never subduct under oceans?
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_, GROUP #: \_\_\_\_\_

- C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?  
a. 7.0  
b. 8.0  
c. 9.0  
d. 10.0
- A 8. What type of energy drives slab pull?  
a. Gravitational energy  
b. Thermal energy  
c. Chemical energy
- D 9. Which of the following is the most general correct explanation of buoyancy?  
a. Buoyancy will occur when two materials of differing temperature interact.  
b. Buoyancy will occur when two materials of differing structure interact.  
c. Buoyancy will occur when two materials of differing phase interact.  
d. Buoyancy will occur when two materials of differing density interact.  
e. Buoyancy will occur when two materials of differing composition interact.
- A 10. Which of the following can cause a tsunami?  
a. The movement of seismic waves through water  
b. The undersea displacement of water  
c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A A. Which of the following are most similar?  
a. Magma erupting and a hot air balloon rising  
b. Magma erupting and an airplane lifting off  
c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
Magma is less dense than its surrounding materials and the hot air balloon is also less dense than its surrounding materials. When things are heated, this causes molecules to move faster making it less dense. Both the magma & hot air balloon are heated making them less dense.

- B. Which of the following are most similar?  
a. Photosynthesis and respiration  
b. Photosynthesis and burning coal  
c. Respiration and burning coal

Please explain your response to B.:  
Respiration and burning coal are similar because they both release carbon dioxide.

STUDENT ID #: A42226062; GROUP #: C

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- a. A discussion of the approximate magnitudes of each earthquake
  - b. A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The magnitude of the Japan earthquake was at a 9.0 and the magnitude for the Haitian earthquake was at a 7.0. Japan is seen as a first world country so they are in a better socioeconomic position than Haiti which is a third world country. Japan is able to afford building buildings that are able to withstand high magnitudes of earthquakes, but not as high as the one they just had. Japan's buildings are able to absorb shock due to their spring like structure. Haiti, however, is near the equator causing them to be exposed to ~~was~~ a warmer climate. Their houses are built out of concrete to stop the spread of malaria. Concrete does not really absorb shock at all which is why even though Haiti was hit with a lower magnitude earthquake, there were more deaths than Japan. Due to Japan's socioeconomic status, they were ~~prep~~ more prepared for the earthquake but they were not prepared for the magnitude. They only had 8 minutes to respond to the earthquake.

STUDENT ID #:

GROUP #:

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy is the relative densities in different materials <sup>interact</sup> causing some materials to rise above others. When materials are heated, molecules move faster ~~causing~~ causing the material to be less dense. As magma rises, it begins to cool down. The magma heats the crust causing it to become more brittle to the point where magma is able to ~~be~~ break through. Even though magma cools as it rises, it is still a liquid and is still ~~dense~~ less dense than the surrounding atmosphere and lithosphere. Magma is ~~still~~ more buoyant than the atmosphere + lithosphere when heated/<sup>rises</sup> and is still more buoyant when it begins to cool.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

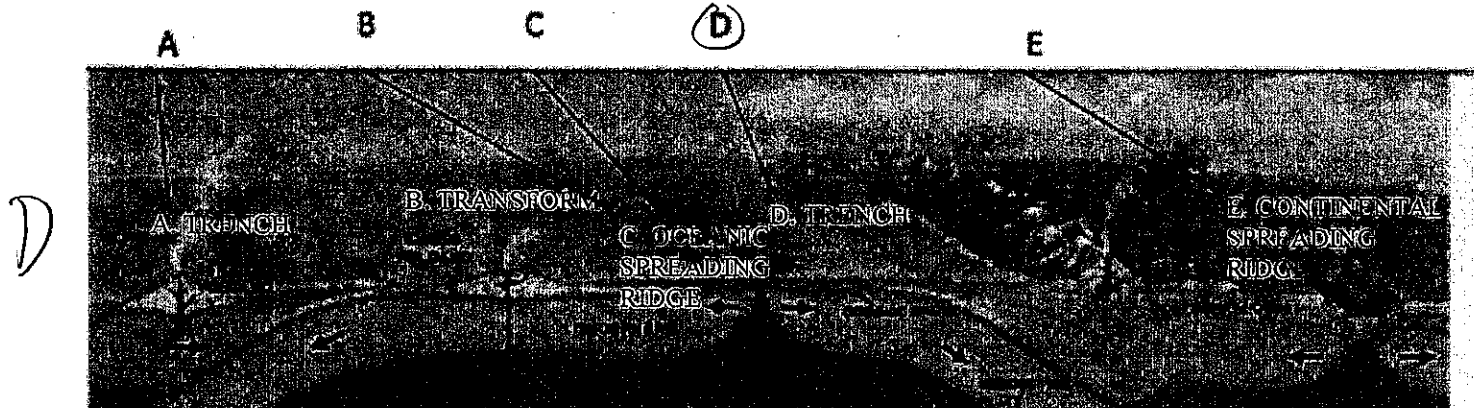
The nuclear power plants were made to withstand a magnitude of ~~6~~ 7.0 so it was not made strong enough to withstand the recent earthquake. Also because of the building codes.



STUDENT ID #: A42741352; GROUP #: C

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- B
- a. Continental crust does not melt very well at convergent boundaries.
  - ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- B
- a. Dissolved load
  - ☒ b. Suspended load
  - c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- YA: D      CO2 estro.      YA: D
- a. A = compaction, B = oxidation, C = photosynthesis
  - ☒ b. A = burial, B = respiration, C = weathering
  - c. A = burial, B = oxidation, C = photosynthesis
  - d. A = compaction, B = degassing, C = photosynthesis

IF this was the  
Question Answer: A

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- C
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- A
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A42741352; GROUP #: C

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- ☐ a. 7.0  
☐ b. 8.0  
☒ c. 9.0  
☐ d. 10.0

8. What type of energy drives slab pull?

- ☒ a. Gravitational energy  
☐ b. Thermal energy  
☐ c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- ☐ a. Buoyancy will occur when two materials of differing temperature interact.  
☐ b. Buoyancy will occur when two materials of differing structure interact.  
☐ c. Buoyancy will occur when two materials of differing phase interact.  
☒ d. Buoyancy will occur when two materials of differing density interact.  
☐ e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- ☒ a. The movement of seismic waves through water  
☐ b. The undersea displacement of water  
☐ c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising  
☐ b. Magma erupting and an airplane lifting off  
☐ c. A hot balloon rising and an airplane lifting off

Please explain your response to A:

A) because the magma is trying to find a buoyancy equilibrium, where both the magma and hot air balloon are less dense than its surrounding... its just trying to rise to find a less dense place

B. Which of the following are most similar?

- ☒ a. Photosynthesis and respiration  
☐ b. Photosynthesis and burning coal  
☐ c. Respiration and burning coal

Please explain your response to B:

Respiration and burning coal both require oxygen (coal requires a flammable substance) but they are both left with CO<sub>2</sub> after the process is complete.

STUDENT ID #: A 42441352; GROUP #: C

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- a. A discussion of the approximate magnitudes of each earthquake
  - b. A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

On March 11<sup>th</sup>, 2011, Japan was hit with an earthquake that had a magnitude of 9.0. While this earthquake in Japan was stronger (higher magnitude) than the earthquake that hit the Haitian people, the death toll is predicted to be in the 10's of thousands vs the 100's of thousands like died in Haiti. A major reason for this is because of the structures that we built. The Haitians have less strict building codes, which are generally unenforced, while Japanese buildings had to survive most tsunamis and earthquakes. Additionally, the construction materials in Haiti were used to protect against hurricanes, but feel easily on 1/12/2010. To end, even though the actual storm was much more powerful in Japan, the people of Haiti were damaged much more severely due to a less advanced economy with much more poverty than Japan.

STUDENT ID #: A42941352; GROUP #: E

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy is a principle that explains when a material or substance is less dense than its surroundings, it will rise. When it's more dense, it will fall. If it has equal density, it will remain where it is, in density equilibrium.

Buoyancy changes as magma rises because if it de-gasses, the density will increase and the magma will have less of a buoyant force driving it upward. Additionally, as magma pushes against continental crust, the magma is forced to be compacted. Because the density is again increased, it has loss of an upward force. (Also, the magma transfers some heat which makes it more dense.) If magma becomes less dense, like when additional water is added, it will rise faster.

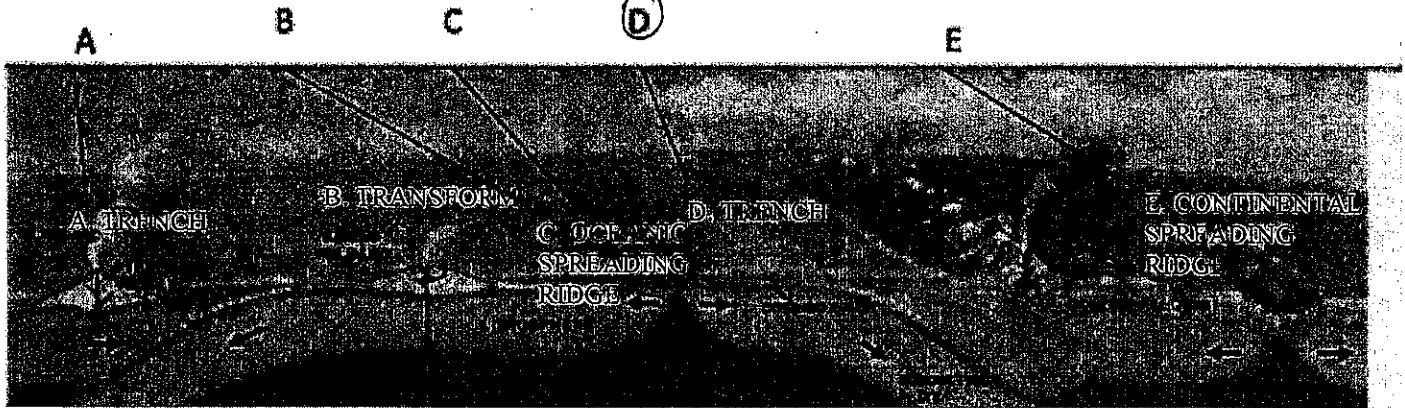
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

The containment shell and the entire reactors were only built to withstand a 7.9 earth quake. Additionally, had the backup generators not failed and water would pump through the cores, there would have been no issue. (Lack of backup generators)

STUDENT ID #: A42609057; GROUP #: C

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- D 1. At which boundary is the ocean likely to be deepest?



- A 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?
- a Continental crust does not melt very well at convergent boundaries.
  - b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

- B 3. Which of these carries the most material in streams?
- a. Dissolved load
  - b Suspended load
  - c. Bed load

- A 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a A = compaction, B = oxidation, C = photosynthesis
- ~~b. A = burial, B = respiration, C = weathering~~
- ~~c. A = burial, B = oxidation, c = photosynthesis~~
- ~~d. A = compaction, B = degassing, c = photosynthesis~~

4A = D

- C 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - c Continent-ocean convergent boundary

- A 6. Why do continents never subduct under oceans?
- a Continental rocks are less dense than oceanic rocks. ✓
  - b. Oceanic rocks are less dense than continental rocks.
  - ~~c. Continental rocks are warmer than oceanic rocks.~~
  - ~~d. Oceanic rocks are warmer than continental rocks.~~

STUDENT ID #: A42609057; GROUP #: C

- (C) 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- 7.0
  - 8.0
  - (C) 9.0
  - 10.0
- (B) 8. What type of energy drives slab pull?
- Gravitational energy
  - (B) Thermal energy
  - Chemical energy
- (D) 9. Which of the following is the most general correct explanation of buoyancy?
- Buoyancy will occur when two materials of differing temperature interact.
  - Buoyancy will occur when two materials of differing structure interact.
  - Buoyancy will occur when two materials of differing phase interact.
  - (D) Buoyancy will occur when two materials of differing density interact.
  - Buoyancy will occur when two materials of differing composition interact.
- (B) 10. Which of the following can cause a tsunami?
- The movement of seismic waves through water
  - (B) The undersea displacement of water
  - The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- (A) A. Which of the following are most similar?
- (A) Magma erupting and a hot air balloon rising
  - Magma erupting and an airplane lifting off
  - A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
The reason that magma rises is buoyancy, as the melted rock is less dense than the surrounding rock. Similarly, hot air balloons also rise since temperature increases yield lower densities.

(less dense)

- (C) B. Which of the following are most similar?
- Photosynthesis and respiration
  - Photosynthesis and burning coal
  - (C) Respiration and burning coal

Please explain your response to B.:  
The two are similar because the bonds are being broken in both to form energy - glucose ( $C_6H_{12}O_6$ ) in respiration and carbon in coal.

breaking glucose  
 $C_6H_{12}O_6$   
breaking carbon

STUDENT ID #: A42609057; GROUP #: C

**SHORT ANSWER. 25 points each (50 points total)**

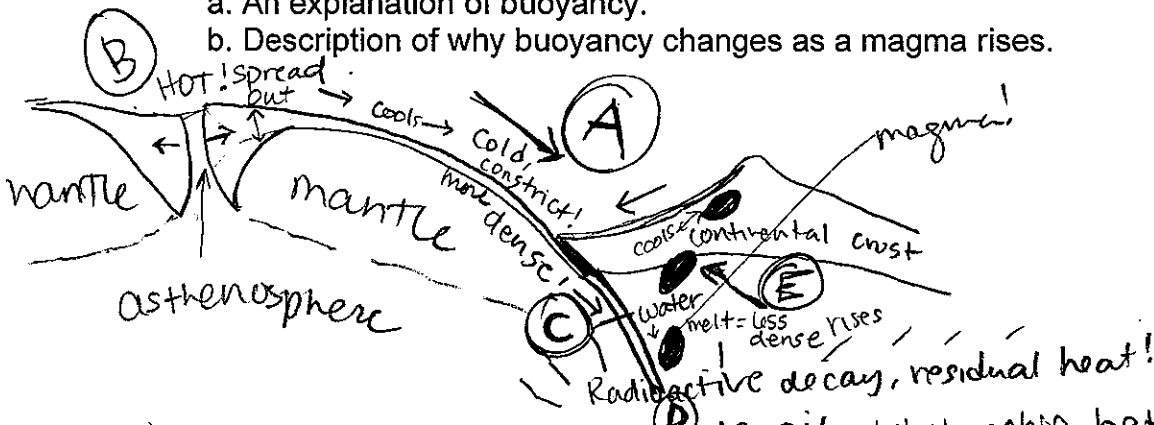
1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include: #3 econ
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The earthquake in Haiti was more deadly than the recent Japanese earthquake because of the type of boundary that it occurred on. While the Japanese earthquake occurred between two convergent oceanic plates (and thus farther from the affected region), the Haitian earthquake happened at a convergent boundary of oceanic and continental boundaries. The result is the devastation of the immediate area of Haiti versus in the ocean. In addition, the socioeconomic statuses of the two nations could hardly be in starker contrast with one another. Japan, as the world's 3rd strongest economy with population growth under control, little poverty and unemployment, could prepare itself well enough for the after-effects and had stronger infrastructure to begin with. Haiti, on the other hand, as a less developed country has a much much much more vulnerable population and suffers from more earthquakes in general. The Caribbean's environment also allowed for the harm of more Haitians than Japanese people affected by the earthquake & tsunami.

STUDENT ID #: A42609057; GROUP #: C

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.



Buoyancy depends on the density relationship between two compositions. The less dense of the two will rise while the more dense will sink to find equilibrium. Density, and subsequently buoyancy, can be changed by temperature. Since the oceanic plate is converging with the continental plate (Point A) and subducting below the less dense continental boundary, slab pull occurs. This happens because the oceanic divergent boundary (Point B) produces hot new crust that forces older, more constricted and dense oceanic crust below. With the subducted oceanic crust, water goes too (Point C), which breaks the bonds of some of the rock under the continental crust. This, with the heat from radioactive decay within the earth (Point D) makes the melted rock (magma) less dense than the surrounding rock. Since buoyancy means that the less dense (Point E) will rise, this magma moves toward the continental crust. As it gets further away from the heat source of radioactive decay, it begins to slow down and cool to achieve equilibrium with its surroundings.



EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

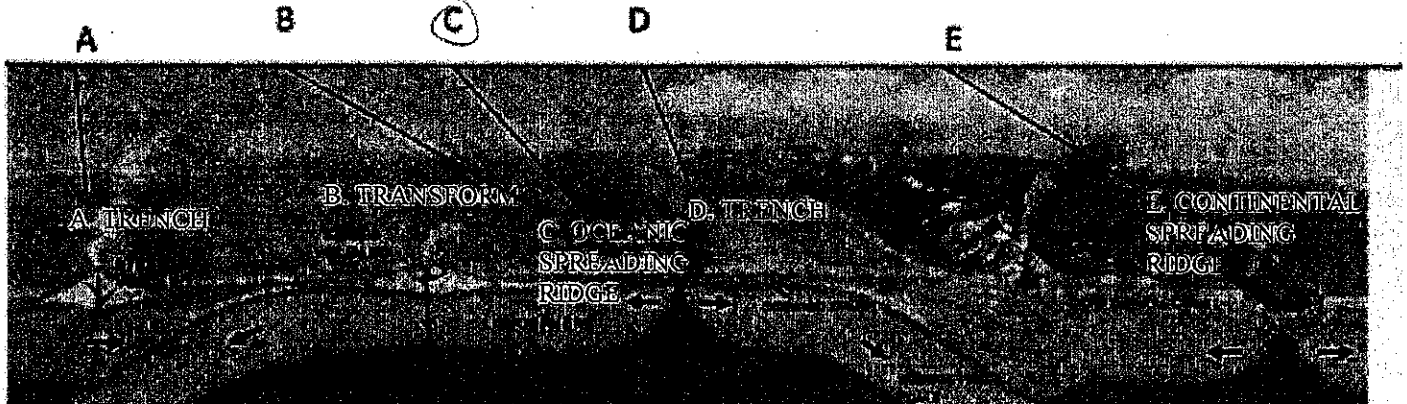
Structural inefficiency



STUDENT ID #: A37599308; GROUP #: D

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- C 1. At which boundary is the ocean likely to be deepest?



- B 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?
- a. Continental crust does not melt very well at convergent boundaries.
  - ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

- B 3. Which of these carries the most material in streams?
- a. Dissolved load
  - ☒ b. Suspended load
  - c. Bed load

- A 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

Question 4.1  
D

- B 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?
- a. Ocean-continent transform boundary
  - ☒ b. Ocean-ocean divergent boundary
  - c. Continent-ocean convergent boundary

- A 6. Why do continents never subduct under oceans?
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A37599308; GROUP #: D

- C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
- B 8. What type of energy drives slab pull?
- a. Gravitational energy
  - ☒ b. Thermal energy
  - c. Chemical energy
- D 9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
- B 10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

When magma erupts it is degassing, when a hot balloon rises it is degassing

- B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:

Both release CO<sub>2</sub>

STUDENT ID #: A37599308 ; GROUP #: D

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Haitian earthquake was a much smaller magnitude (approx. 6) than the Japan Earthquake (with a magnitude of 9). For many reasons the Haitian earthquake was much more deadlier than the Japan quake. In Haiti the epicenter of the earthquake was closer to the land and was deeper into the lithosphere. In Japan, the quake was further from the land but was not as deep (approx. 25km) as the Haitian quake. The Haitian quake although not as close to the surface caused many more deaths and destruction due to the epicenter being closer to land. Although environmental factors were a large contribution, socioeconomic factors also played a role in the greater amount of damage in Haiti. Japanese buildings are built on springs which sit on a slab of concrete, this allows the buildings to flow/rock/sway with the movement of the quake. Haitian construction is not built in this way due to it being a poorer country. Haitian buildings are not built in this way to sustain earthquakes.

STUDENT ID #: A31599308; GROUP #: D

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.



Buoyancy is the force which cause materials with different densities to rise and fall relative to densities in one another. Buoyancy causes more dense materials to sink and less dense materials to rise.

The buoyant force on magma rises causes magma - at the location of magma formation to rise. At the location of magma formation, the magma is less dense than the surrounding rock. This causes the rock to push under the magma (gravity) and pushes the magma up (shown by picture above of a block in water). While magma rises buoyant forces decrease because the magma is cooling and becoming more dense - or more similar density to its surroundings. When the magma is rising sometimes it will solidify and not lead to eruption.

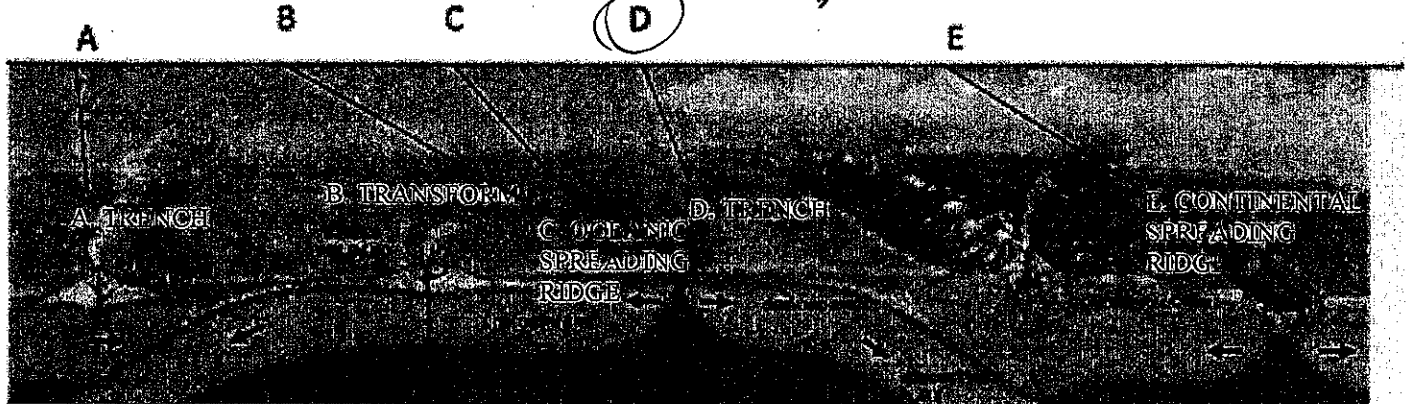
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

1. Were not built to withstand this high magnitude of a quake.
2. The quake generated a tsunami and it wasn't built to

STUDENT ID #: A40177778; GROUP #: D

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- ☒ a. Continental crust does not melt very well at convergent boundaries.  
☐ b. Continental crust is so thick that melt cools before it reaches the surface.  
☐ c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- ☒ a. Dissolved load  
☐ b. Suspended load  
☐ c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis  
☐ b. A = burial, B = respiration, C = weathering  
☐ c. A = burial, B = oxidation, C = photosynthesis  
☐ d. A = compaction, B = degassing, C = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- ☒ a. Ocean-continent transform boundary  
☐ b. Ocean-ocean divergent boundary  
☐ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.  
☐ b. Oceanic rocks are less dense than continental rocks.  
☐ c. Continental rocks are warmer than oceanic rocks.  
☐ d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- C  
a. 7.0  
b. 8.0  
c. 9.0  
d. 10.0

8. What type of energy drives slab pull?

- B  
a. Gravitational energy  
b. Thermal energy  
c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- D  
a. Buoyancy will occur when two materials of differing temperature interact.  
b. Buoyancy will occur when two materials of differing structure interact.  
c. Buoyancy will occur when two materials of differing phase interact.  
d. Buoyancy will occur when two materials of differing density interact.  
e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- B  
a. The movement of seismic waves through water  
b. The undersea displacement of water  
c. ~~The heating of water during an earthquake~~

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- A  
a. Magma erupting and a hot air balloon rising  
b. Magma erupting and an airplane lifting off  
c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

The rock surrounding magma is 1/3 the cold air around a hot air balloon is more dense. The magma heats the surrounding rock as it passes through 1/3 the gas from the balloon heats the air as it rises.

B. Which of the following are most similar?

- C  
a. Photosynthesis and respiration  
b. Photosynthesis and burning coal  
c. Respiration and burning coal

Please explain your response to B.:

Both release carbon dioxide into the atmosphere

STUDENT ID #: A4017777B; GROUP #: D

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

A. The recent earthquake in Japan was approximately a magnitude of 9 while the 2010 earthquake in Haiti was approximately a magnitude of 7. However the earthquake in Haiti occurred much closer to the land in Haiti while the earthquake in Japan was further away from the land but not as deep into the Earth's surface as the one in Haiti. Because the one in Japan causes fractures in the ocean floor, water was displaced vertically causing the tsunami.

B. Japan is a more economically developed country than Haiti, allowing them to spend more money preparing their buildings and citizens for natural disasters. For example, the buildings in Japan are built upon springs which allow them to move with the shifting earth rather than collapse. The steel which reinforces these buildings is also more bendable than the concrete used in Haiti. Japan is also more technologically savvy in that they can inform citizens  $\frac{1}{2}$  hopefully evacuate to higher ground sooner than the Haitians.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

As material becomes less dense it becomes more buoyant. That is the buoyant force will cause the less dense material to rise and displace the area left underneath the rising material. Similarly, when material becomes more dense the buoyant force will push the material down and replace the area it previously occupied.

With magma, melting begins as the asthenosphere interacts with water in the rock from the ocean. The rock melts into magma, which is now less dense than its surrounding rock. Buoyancy begins pushing the less dense magma through the rock & displacing the rock the magma previously occupied with more dense rock. As magma rises and begins to cool, it will become more dense and therefore less buoyant, this will slow its descent as it settles in the lithosphere or heats the crust and erupts into a volcano.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

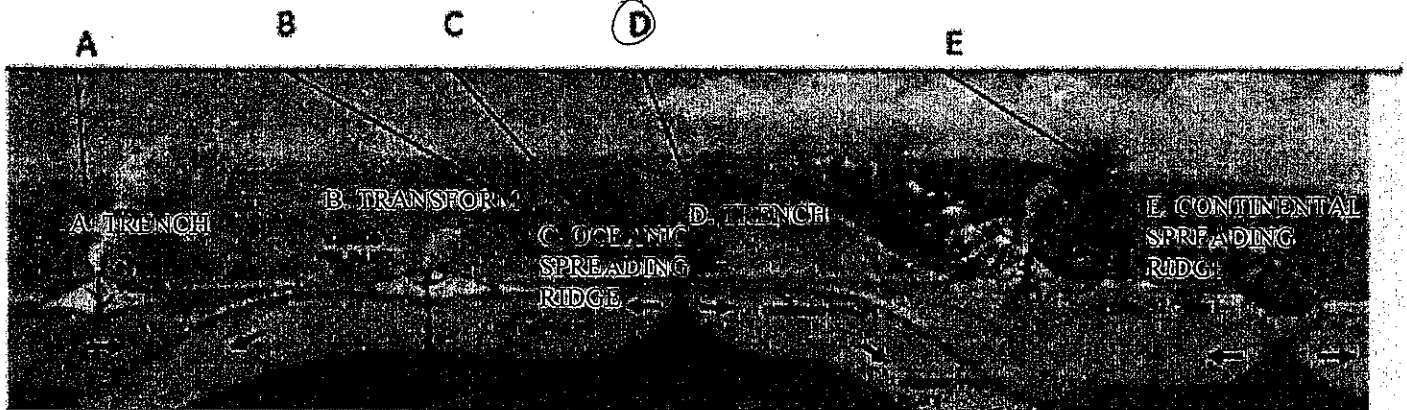
They only built the earthquake to withstand a magnitude of 8.5 and the recent earthquake in Japan was a magnitude of 9.



STUDENT ID #: 43570651; GROUP #: D

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- D 1. At which boundary is the ocean likely to be deepest?



- B 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?
- a. Continental crust does not melt very well at convergent boundaries.
  - ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

- C 3. Which of these carries the most material in streams?
- a. Dissolved load
  - b. Suspended load
  - ☒ c. Bed load

- ☒ 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- ☒ b. A = burial, B = respiration, C = weathering
- ☒ c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

- C 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - ☒ c. Continent-ocean convergent boundary

- A 6. Why do continents never subduct under oceans?
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

D 1A

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

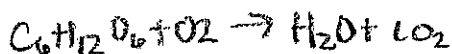
- C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
- A 8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
- D 9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
- B 10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
Magma erupts b/c it is less dense than the surrounding area so it pushes upward and hot air rising has the same effect b/c it's less dense than the surrounding area, it's like buoyancy.

- C B. Which of the following are most similar?
- ☒ a. Photosynthesis and respiration opposite
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal



Please explain your response to B.:  
As you burn coal, it releases  $\text{CO}_2$  into the environment, as with respiration, it also releases  $\text{CO}_2$ .

STUDENT ID #: A43570651; GROUP #: D

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

A. The Japanese earthquake was a magnitude 9.0, it was only around 8-9 miles below the surface, the epicenter was further away from the land, Japan's economy is very wealthy so they have more precautions, nicer buildings, had a plan in case an earthquake were ever to occur. The # of death tolls was only around 10,000 b/c they were able to also keep people in shelters, provide them w/ food & water so they didn't have to go outside where there was radiation spill.

B. The Haitian earthquake was a magnitude of around 7.3, it was about 20 miles under the earth's surface and the epicenter was much closer. Haiti has a much poorer economy than Japan, they have less stable buildings and they had no plans had an earthquake occur. The # of deaths was about 200-300,000 people because the water they drank had diseases (malaria in it), environment was very unsanitary, didn't have much shelter. Most people died from the aftermath of the earthquake rather than the initial earthquake.

STUDENT ID #: 01; GROUP #: 12/15/2011

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

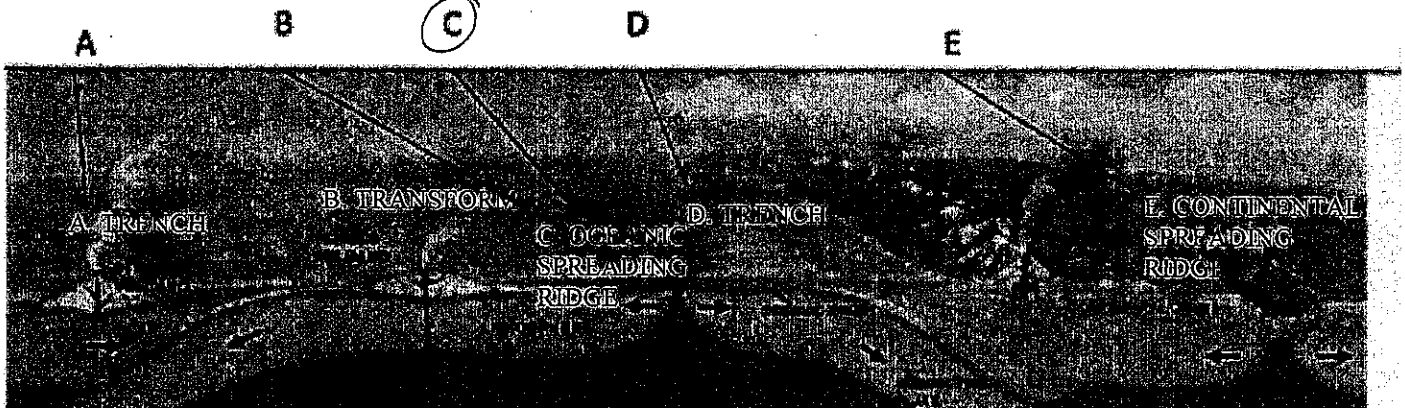
Buoyancy is when less dense materials rise, while denser materials fall. Magma rises b/c it is less dense than the surrounding area. The composition of magma changes b/c at many areas such as subduction zones, water molecules get into the magma causing it to be less dense, rising to the surface where it may erupt. As the magma rises to the surface, the temperature cools down than what it was initially at. As the temperature decreases, the magma hardens which ends up being the collective magma that doesn't erupt.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

STUDENT ID #: A40627897; GROUP #: D

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest? C



2. Why does very little volcanic activity occur at continent-continent convergent boundaries? b

- a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams? a

- a. Dissolved load
- b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks? C

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- ☒ a. 7.0
  - b. 8.0
  - c. 9.0
  - d. 10.0
8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
10. Which of the following can cause a tsunami?
- ☒ a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

magma & a hot air balloon  
both rise due to differing  
densities from their surrounding.

- B. Which of the following are most similar?
- ☒ a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - c. Respiration and burning coal

Please explain your response to B.:

PHOTOSYNTHESIS is the  
same as respiration  
reversed.

STUDENT ID #: A406278097; GROUP #: D

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Haitian earthquake was a smaller magnitude than the earthquake in Japan. The reason the damage was so much worse is that Haiti is less prepared for earthquakes. Haiti is a much less developed country so they do not have as strong of reinforcements in the buildings as there is in Japan. Also Japan has more technology & they were able to predict the earthquake was coming 8 minutes before it did. This saved thousands of lives.

STUDENT ID #:

0

GROUP # 63014

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy occurs from a difference in density. Less dense objects will rise above more dense objects. As magma heats up it becomes less dense. It also degases which lowers the density. As its density decreases, it rises through the asthenosphere and lithosphere. It eventually breaks through the crust and causes a volcano. Because the density of the magma is less than the earth's layers, the magma rises.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

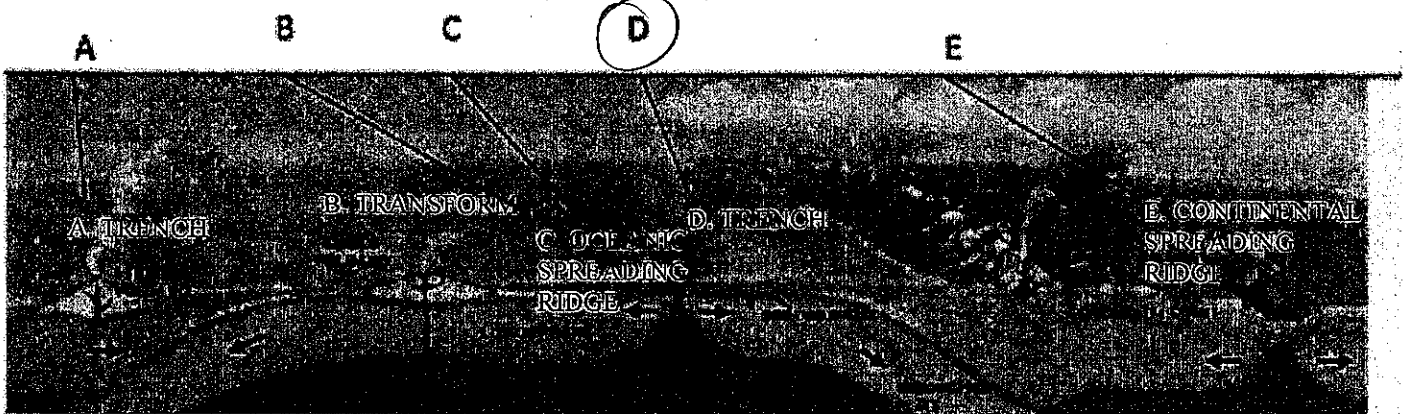
The power plant was not built to withstand the tsunami that followed the earthquake.



STUDENT ID #: A42190700; GROUP #: E

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- ☒ a. Continental crust does not melt very well at convergent boundaries. ✓
- b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- ☒ c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

4A: D

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A42190700; GROUP #: E

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
They are the result of the same causality principle: When materials move faster they get warmer and less dense. This cause the air to expand in the balloon and the magma to rise.

- B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:  
Both release harmful carbon dioxide into the atmosphere.

STUDENT ID #: A42190700; GROUP #: E

SHORT ANSWER. 25 points each (50 points total)

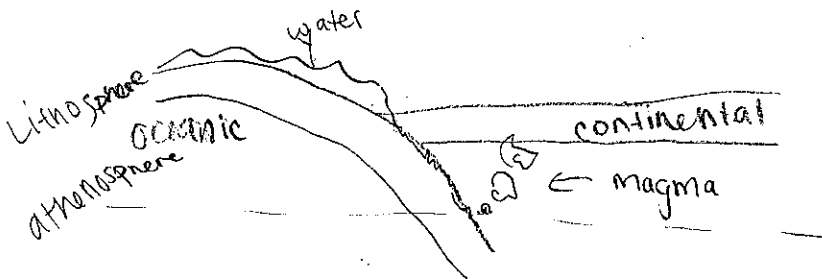
1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The earthquake in Japan had a magnitude of 9 and Haiti had a magnitude relative to 7. The Haitian earthquake was a lot deadlier than the Japan earthquake. This had a lot to do with Haiti's infrastructure. Their houses were built of concrete to protect for <sup>(environmental)</sup> hurricanes. Japan's buildings are reinforced with steel and some are built on springs to allow swaying during an earthquake. This shows the importance of building codes. Haiti doesn't have the economic means that Japan does. Japan was able to <sup>(Socioeconomic)</sup> afford a warning system to warn people of the earthquake and tsunami. This gave people an extra 8 minutes to get to high ground or take cover.

STUDENT ID #: A42190700 ; GROUP #: E.

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy deals with the rising or falling of material due to density of surrounding materials. Magma rises because it is less dense than surrounding materials. As it rises dissolved gasses in the magma, which lead to a decrease density, have a chance of degassing. When the gasses leave this causes the magma to become more dense and less buoyant. It is still less dense than the surrounding material and will continue to rise, just at a slower rate. It is also possible for the magma to cool as it rises, this would effect density and buoyancy somewhat as well.



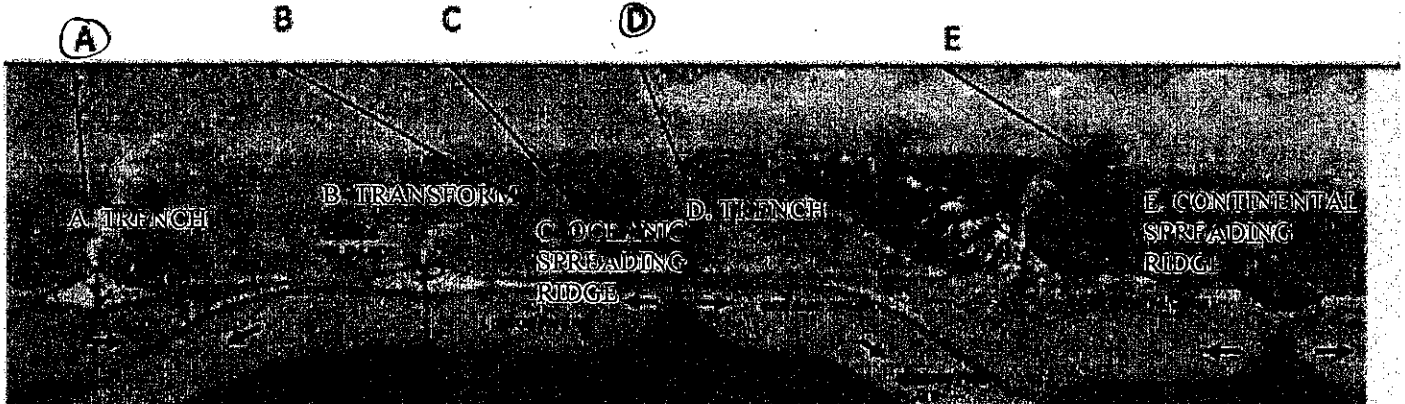
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake? The powerplant was only built to withstand a 7.9 earthquake. The building codes in Japan didn't cause it to be built to withstand more. The steel also caused the plant to have to be cooled.

and the recent one was a 9.

STUDENT ID #: A40518651; GROUP #: E

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

a. Continental crust does not melt very well at convergent boundaries.  
b. Continental crust is so thick that melt cools before it reaches the surface.  
c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

a. Dissolved load  
b. Suspended load  
c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

a. A = compaction, B = oxidation, C = photosynthesis  
b. A = burial, B = respiration, C = weathering  
c. A = burial, B = oxidation, C = photosynthesis  
d. A = compaction, B = degassing, C = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

a. Ocean-continent transform boundary  
b. Ocean-ocean divergent boundary  
c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

a. Continental rocks are less dense than oceanic rocks.  
b. Oceanic rocks are less dense than continental rocks.  
c. Continental rocks are warmer than oceanic rocks.  
d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A40518651; GROUP #: E

- C7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
- A8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
- D9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
- B10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water.
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A.. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

magma and the hot air balloon both contain hot temps, which cause them to be not as dense as their surroundings, which cause them to rise due to buoyancy.

- B. Which of the following are most similar?
- ☒ a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - c. Respiration and burning coal

Please explain your response to B.:

STUDENT ID #: A40518681; GROUP #: E

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.


The earthquake in Japan had a magnitude of ~9.0, and the earthquake in Haiti was about magnitude 6.0. Although the earthquake in Japan was of a higher magnitude, many more deaths resulted from the Haitian earthquake. One major reason the earthquake was so destructive to Haiti was because they have a considerably lower SES than Japan, and therefore do not have the necessary preventative measures to protect them from such natural disasters. Also, Japan has an incredible preventative response plan for when earthquakes hit, so they not only are at an advantage by having a better SES, they are also well equipped with plans for what to do and how to react when such disasters hit.

STUDENT ID #: A 40518651; GROUP #: E

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy explains the movement of things on earth. It is related to the temperature and density of objects. As magma rises from the earth's surface it begins the process of convection, which states that as things rise they become less dense, and then begin to cool and fall. When the magma begins to rise, it also begins to cool and become less dense, which relates to the relative buoyancy of the magma rising toward the earth's surface.



EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

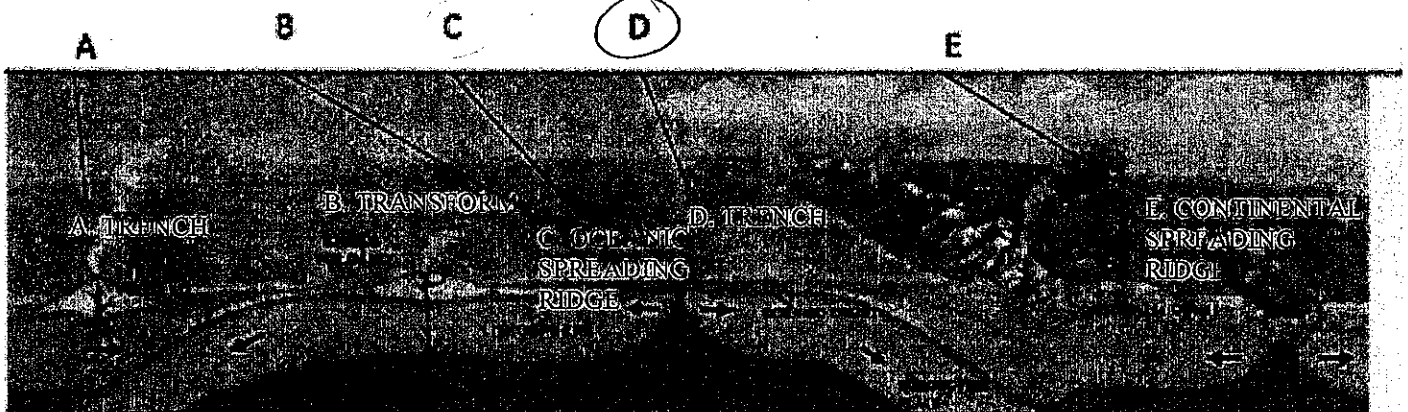
① The nuclear power plant was built on a fault line. ②



STUDENT ID #: A39228160; GROUP #: E

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

D1. At which boundary is the ocean likely to be deepest?



B2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

B3. Which of these carries the most material in streams?

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

D4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- ☒ d. A = compaction, B = degassing, C = photosynthesis

4A) D

C5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

A6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- ~~b. Oceanic rocks are less dense than continental rocks.~~
- c. Continental rocks are warmer than oceanic rocks.
- ~~d. Oceanic rocks are warmer than continental rocks.~~

STUDENT ID #: A392281600; GROUP #: E-0104

- C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
- B 8. What type of energy drives slab pull?
- a. Gravitational energy
  - ☒ b. Thermal energy
  - c. Chemical energy
- D 9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
- B 10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- C A. Which of the following are most similar?
- a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - ☒ c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
Magma erupts because of gas bubbles bursting and is formed because of composition changes.

- C B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

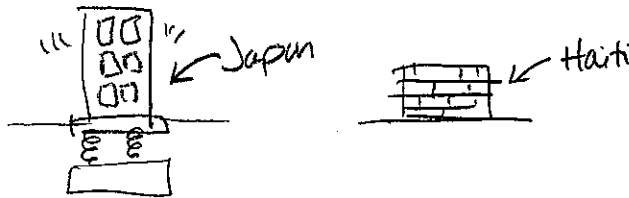
Please explain your response to B.:  
In both instances oxidation is occurring.

STUDENT ID #: A39228160 ; GROUP #: E

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The earthquake in Japan was magnitude 9 - very severe, while the earthquake in Haiti was a 7 - not very severe. While the earthquake in Japan was much more intense, the residents of Japan are aware that their country is prone to earthquakes (it is near a fault - ocean-continent convergent boundary) so they have better planned for earthquakes. The Japanese build their buildings with pliable steel and incorporate springs into building foundations to help the structure move with the earthquake. In Haiti, they do not have the means for this type of advanced construction. It is too expensive to build with steel, so concrete block is used. The block can't move with the earthquake, so the effects were much more devastating. The buildings in Haiti crumbled, killing + injuring many people while the buildings in Japan swayed and remained mostly intact.

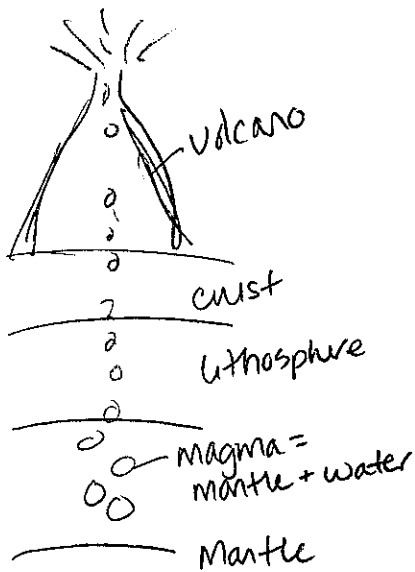


STUDENT ID #: A39228160; GROUP #: E

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy - the amount of energy it takes to displace an object in water, which occurs when different objects w/ different densities interact.



When the mantle and water are combined, liquid magma is created. The liquid magma is heated by the hot core. As the magma rises (because it is less dense than what is surrounding it/more buoyant), it begins to cool. As the magma cools, it becomes more dense/less buoyant. The magma eventually reaches the crust. It then warms the crust, making it easier for the magma to push through (even though it became less buoyant while rising). The major impact on magma's buoyancy is its change in density because of cooling.

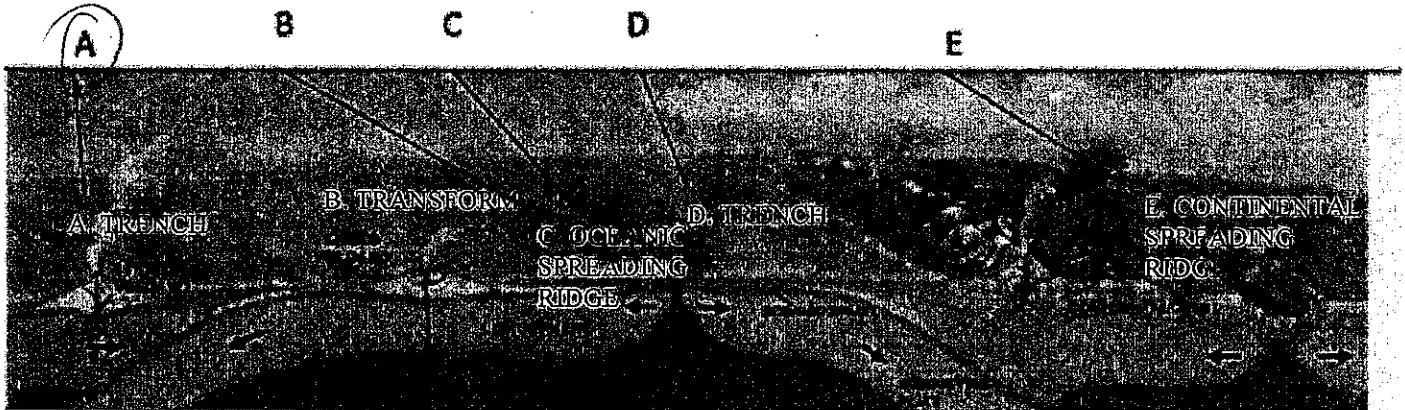
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

- It was not built to withstand a magnitude 9 earthquake
- Building codes are not as strict in Japan compared to the US.

STUDENT ID #: A41503028; GROUP #: E

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- A
- a. Continental crust does not melt very well at convergent boundaries.
  - b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- C
- a. Dissolved load
  - b. Suspended load
  - c. Bed load

extra credit 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- A
- a. A = compaction, B = oxidation, C = photosynthesis
  - b. A = burial, B = respiration, C = weathering
  - c. A = burial, B = oxidation, C = photosynthesis
  - d. A = compaction, B = degassing, C = photosynthesis

\* 4a. D

C 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- A
- a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A41503028; GROUP #: E

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- C  
a. 7.0  
b. 8.0  
c. 9.0  
d. 10.0

8. What type of energy drives slab pull?

- A  
a. Gravitational energy  
b. Thermal energy  
c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- D  
a. Buoyancy will occur when two materials of differing temperature interact.  
b. Buoyancy will occur when two materials of differing structure interact.  
c. Buoyancy will occur when two materials of differing phase interact.  
d. Buoyancy will occur when two materials of differing density interact.  
e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- B  
a. The movement of seismic waves through water  
b. The undersea displacement of water  
c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- a. Magma erupting and a hot air balloon rising  
b. Magma erupting and an airplane lifting off  
c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

magma becomes less dense as it rises due to temperature just like the heat in balloon causes it to be less dense & then rise

B. Which of the following are most similar?

- a. Photosynthesis and respiration  
b. Photosynthesis and burning coal  
c. Respiration and burning coal

Please explain your response to B.:

both systems deal w/ carbon cycles

STUDENT ID #: A41503028; GROUP #: E

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

so they were  
unprepared for such  
a huge 2nd quake

1st

The Japan earthquake isn't actually what caused such a mess, it was the tsunami that followed that was so devastating. The magnitude of the actual earthquake itself in Japan was @ only around a 6.0, the events following are what caused so much damage. The Haitian earthquake was actually a larger magnitude in itself, w/out a tsunami. Much of Japan's struggle has to deal w/ the fact the plates where the quake happened had been inactive for about 1,000 years, & thus they believed the "cracking" under surface would be an extremely slow process over many years. However, since the earthquake in Japan happened earlier in the day, they could take better shelter, predict some sort of tsunami aftermath, & also b/c it was so early, unlike the quake in Haiti (where they are already less prepared for natural disasters) people weren't out-and-about. In Haiti, people were working, in school, out to eat, etc. Also, the buildings in Haiti which were making food (restaurants/homes) resulted in fires due to the earthquakes effects on their older, poorly designed buildings.

STUDENT ID #: A41503028; GROUP #: 2

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

An element's density determines its buoyancy.  
- As magma rises from subduction zones due to plates' pressure & temperature, magma becomes LESS dense, and MORE buoyant. The temperature of this hot magma causes surrounding matter (ie. continental crust) to melt in order to let the magma continue rising toward the surface, & out the volcano.

↓ less  
density = more  
buoyancy.  
MORE density =  
less buoyancy.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

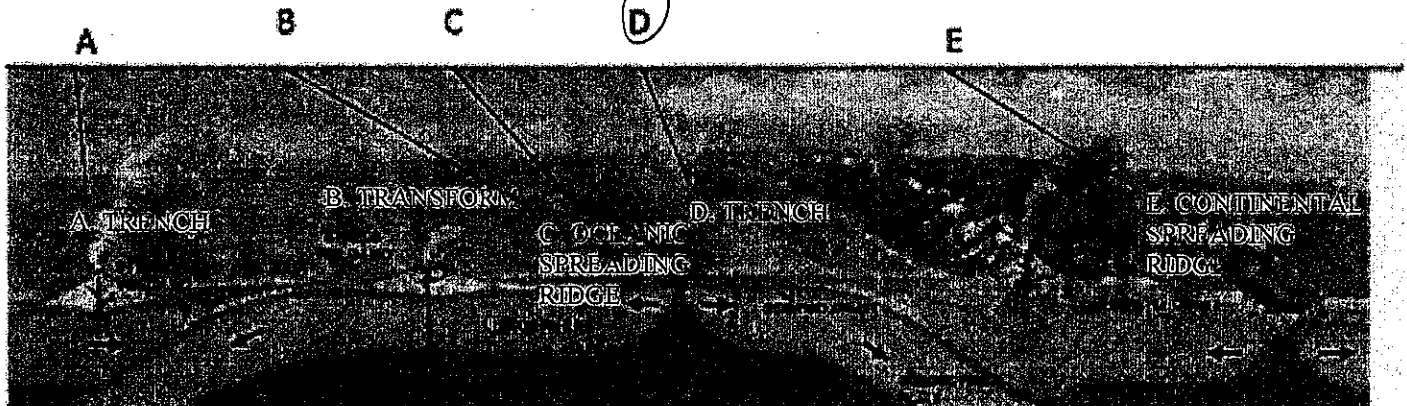
Buildings which held them  
did not meet "strength criteria" (destroyed buildings)



STUDENT ID #: A42385484; GROUP #: F

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest? ☒ D



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

☒ 3. Which of these carries the most material in streams?

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

☒ 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

4A.  
A.

☒ 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- ☒ b. Ocean-ocean divergent boundary
- c. Continent-ocean convergent boundary

☒ 6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A42385484; GROUP #: F

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

Heat causes the magma & Hot Air balloon to Rise, the release of gas causes the magma to erupt & allows the balloon to take off.

- B. Which of the following are most similar?
- ☒ a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:

Coal is formed from dead plants, the energy in the coal is the left over energy in the plant called Respiration.

When burning coal we are burning the "stored" energy from the dead plants, that sank into the ground & formed coal.

STUDENT ID #: A47385484; GROUP #: F

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Haitian earthquake was a magnitude of 10, while the Japanese earthquake was only a magnitude of 9. Haiti is a 3<sup>rd</sup> world country, meaning they didn't have up-to-date structures that could withstand a large earthquake, unlike Japan which is one of the largest economies in the world. With Japan being so powerful they had the resources to evacuate as quickly as they could, & to seek shelter. Again, with Haiti being a "poor" country they weren't able to do this as easily. Haiti also was in closer proximity to the earthquake compared to Japan, so they felt the earthquake more. Japan mainly got damaged by the tsunami wave. With Haiti being a mountainous region, buildings were more susceptible to falling from the earthquake compared to Japan's relatively flat land.

STUDENT ID #: A423 B5484; GROUP #: F

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy is related to density. The more dense something is, the less buoyant it is, and the less dense something is the more buoyant it is. Buoyancy can be thought of as how well something floats. Buoyancy changes as magma rises for various reasons. At the start, the magma is very hot, making it less dense than the surrounding asthenosphere. The magma is very buoyant, so it rises through the asthenosphere. As the magma continues to rise, it begins to cool, which increases its density and decreases its buoyancy. The magma will not equilibrium in the lithosphere, where it will remain until the magma degases. The degassing process causes the magma to erupt, & it causes the buoyancy to increase as well.

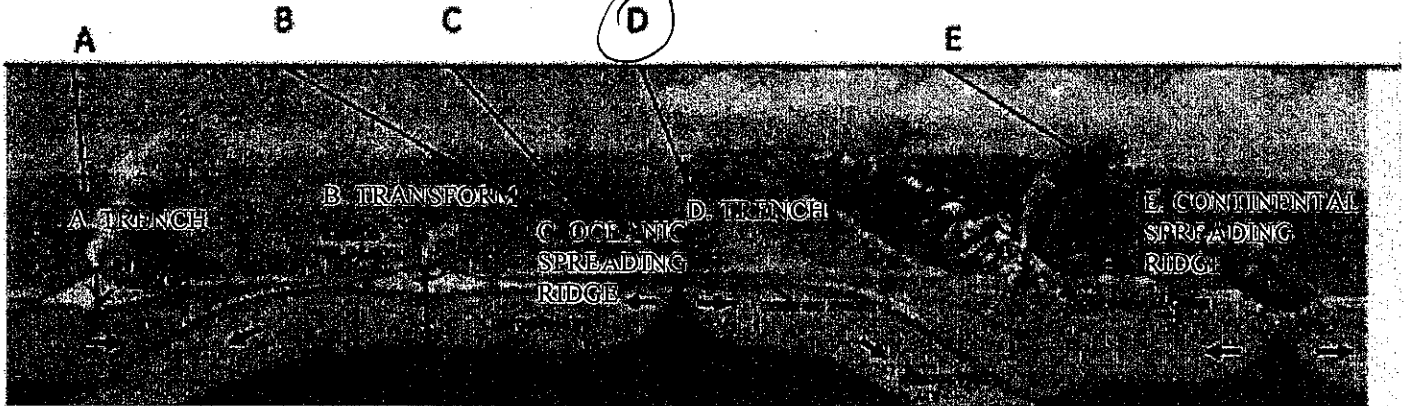
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

Large amounts of water got into the power plant causing a reaction for it to blow up. When the plant was built they didn't expect this large of a tsunami/earthquake to occur.

STUDENT ID #: A43864729; GROUP #: F

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- B
- a. Continental crust does not melt very well at convergent boundaries.
  - b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- B
- a. Dissolved load
  - b. Suspended load
  - c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- D
- a. A = compaction, B = oxidation, C = photosynthesis
  - b. A = burial, B = respiration, C = weathering
  - c. A = burial, B = oxidation, c = photosynthesis
  - d. A = compaction, B = degassing, c = photosynthesis
- 1 A = D

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- B
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- C
- a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- C*
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0

8. What type of energy drives slab pull?

- A*
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- D*
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- B*
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising
- b. Magma erupting and an airplane lifting off
- c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

*Both use thermal energy*

B. Which of the following are most similar?

- ☒ a. Photosynthesis and respiration
- b. Photosynthesis and burning coal
- c. Respiration and burning coal

Please explain your response to B.:

*Both are creating something  
through the energy of  
heat*

STUDENT ID #: A43864729; GROUP #: F

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

Although both earthquakes were deadly, the Japanese were more prepared for the earthquake, the main thing that the Haitian people had to deal with was the tsunami. Japan is a much more developed country which can explain why they were more prepared for the devastation. The magnitudes were different, but both were very high, I think the main difference was the environmental factors and the fact that they were better prepared economically and that helped them, what didn't help was all the power plants.

STUDENT ID #:

7

GROUP # P/REBEKA

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

By definition buoyancy occurs when two materials of differing densities interact.

So it can be explained through the definition of buoyancy why the buoyancy changes as magma

risks towards earth surface it is interacting with different types of densities, and that's when

buoyancy occurs, it is rising through different layers that all have different densities some greater and some lower than the magma itself, but nonetheless different densities are interacting before the magma hits the surface.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

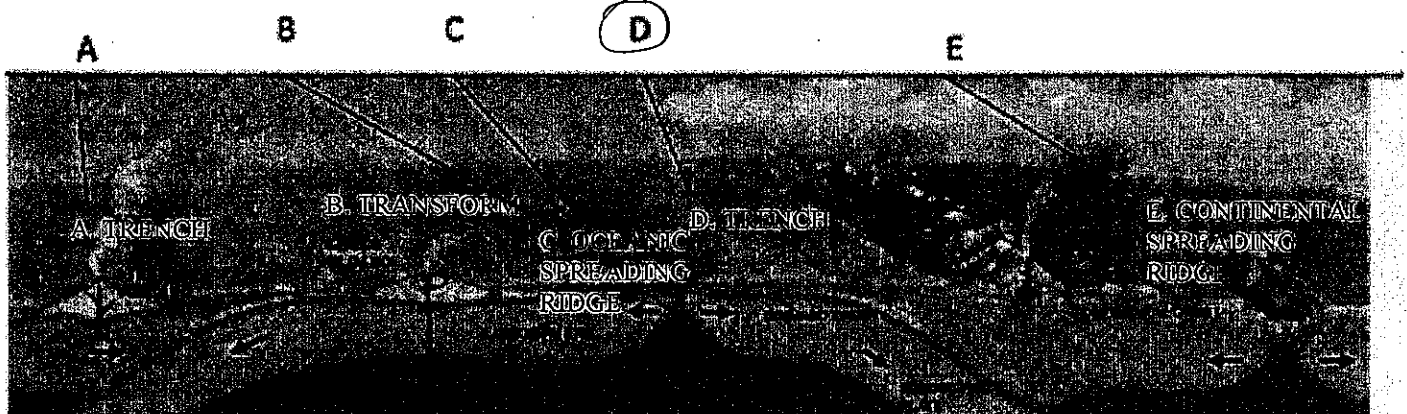
The tsunami and the lack of structural integrity.



STUDENT ID #: A42766836; GROUP #: F

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



B 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

B 3. Which of these carries the most material in streams?

- a. Dissolved load
- b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

4a. D

C 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- c. Continent-ocean convergent boundary

A 6. Why do continents never subduct under oceans?

- a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A 42766836; GROUP #: F

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- C  
a. 7.0  
b. 8.0  
c. 9.0  
d. 10.0

8. What type of energy drives slab pull?

- A  
a. Gravitational energy  
b. Thermal energy  
c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- D  
a. Buoyancy will occur when two materials of differing temperature interact.  
b. Buoyancy will occur when two materials of differing structure interact.  
c. Buoyancy will occur when two materials of differing phase interact.  
d. Buoyancy will occur when two materials of differing density interact.  
e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- B  
a. The movement of seismic waves through water  
b. The undersea displacement of water  
c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- A  
a. Magma erupting and a hot air balloon rising  
b. Magma erupting and an airplane lifting off  
c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

They both have less density than the air and rock around them which cause them to rise. Caused by the hot temperature

B. Which of the following are most similar?

- C  
a. Photosynthesis and respiration  
b. Photosynthesis and burning coal  
c. Respiration and burning coal

Please explain your response to B.:

They are both processes that release energy and CO<sub>2</sub> when they occur.

STUDENT ID #: 4112766836; GROUP #: F

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The earthquake in Japan had a magnitude of about 9.0 while the Haitian earthquake had a magnitude of about a 7.0. Haiti as a poorer economic country, could not afford the same earthquake safety measures as Japan did. Japan built skyscrapers that could be protected from an earthquake of any magnitude while Haiti only had concrete buildings. Haiti is more prepared for hurricanes than earthquakes because they happen much more often. More Haitian people died in the earthquake because they were more prepared for hurricane weather than an earthquake. The Japanese have earthquakes all the time so they were more prepared for their earthquakes. There was less death in Japan because they were more prepared for an earthquake to occur.

STUDENT ID #: A42766836; GROUP #: F

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy causes the less dense material to rise. Magma rises because it is less dense. When the magma is near the mantle, it has a lot of gas, and is way less dense than the surrounding asthenosphere so it rises. As magma continues upward, it degasses and becomes more dense. As the magma becomes more dense, it slows down.

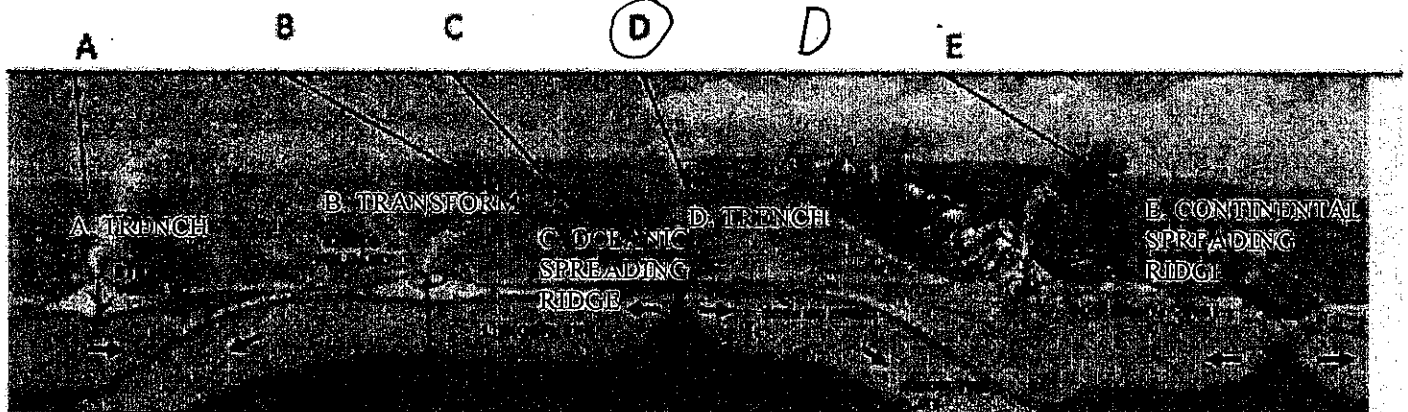
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

The Nuclear power plants were only able to withstand a earthquake of 7.0 magnitude, and As the tsunami hit the Nuclear plants, the cooling system broke and the nuclear rods were unable to cool down.

STUDENT ID #: A41450320; GROUP #: F

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- ☐ a. Continental crust does not melt very well at convergent boundaries.  
☒ b. Continental crust is so thick that melt cools before it reaches the surface.  
☐ c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- ☐ a. Dissolved load  
☒ b. Suspended load  
☐ c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☐ a. A = compaction, B = oxidation, C = photosynthesis  
☐ b. A = burial, B = respiration, C = weathering  
☐ c. A = burial, B = oxidation, C = photosynthesis  
☐ d. A = compaction, B = degassing, C = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- ☐ a. Ocean-continent transform boundary  
☒ b. Ocean-ocean divergent boundary.  
☐ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.  
☐ b. Oceanic rocks are less dense than continental rocks.  
☐ c. Continental rocks are warmer than oceanic rocks.  
☐ d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A41450320; GROUP #: F

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- a. 7.0
- b. 8.0
- ☒ c. 9.0
- d. 10.0

9 C

8. What type of energy drives slab pull?

- ☒ a. Gravitational energy
- b. Thermal energy
- c. Chemical energy

A

9. Which of the following is the most general correct explanation of buoyancy?

- a. Buoyancy will occur when two materials of differing temperature interact.
- b. Buoyancy will occur when two materials of differing structure interact.
- c. Buoyancy will occur when two materials of differing phase interact.
- ☒ d. Buoyancy will occur when two materials of differing density interact.
- e. Buoyancy will occur when two materials of differing composition interact.

D

10. Which of the following can cause a tsunami?

- a. The movement of seismic waves through water
- ☒ b. The undersea displacement of water
- c. The heating of water during an earthquake

B

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising
- b. Magma erupting and an airplane lifting off
- ~~c. A hot balloon rising and an airplane lifting off~~

Please explain your response to A.: A

They are both propelled upward due to heat causing less density

B. Which of the following are most similar?

- a. Photosynthesis and respiration
- b. Photosynthesis and burning coal
- ☒ c. Respiration and burning coal

Please explain your response to B.: C

They both use up oxygen and create CO<sub>2</sub>

Photosynthesis - CO<sub>2</sub> → O<sub>2</sub>  
Respiration - O<sub>2</sub> → CO<sub>2</sub>

STUDENT ID #: A41450320; GROUP #: 2F

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

A. The Japanese earthquake was roughly a 9.0 on the scale, while the Haitian one was around a 7.0. So we can see that the energy released was 100 times greater in Japan, but we also see that the death toll was 20 times greater in Haiti, thus

B This leads us to realize that it was the poor condition of the buildings in Haiti combined with a government that was unable to deal with the crisis, whereas in Japan we see a strong government relief effort and higher building codes.

STUDENT ID #: A41450320; GROUP #: F

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy is the density relationship between various agents. It is affected by density, heat, and pressure.

The earth pulls on everything with gravity. It pulls harder on denser objects making them fall/sink. The lighter or less dense objects then rise/float.

So we see with magma that as it heats up its density decreases leading it to rise toward the surface. The

buoyancy decreases as it nears the surface and begins to cool. Also there are gases within the magma which help to lower density increasing buoyancy. But as they come to the mantle they are degassed and leave the magma, dramatically increasing density which lowers buoyancy.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

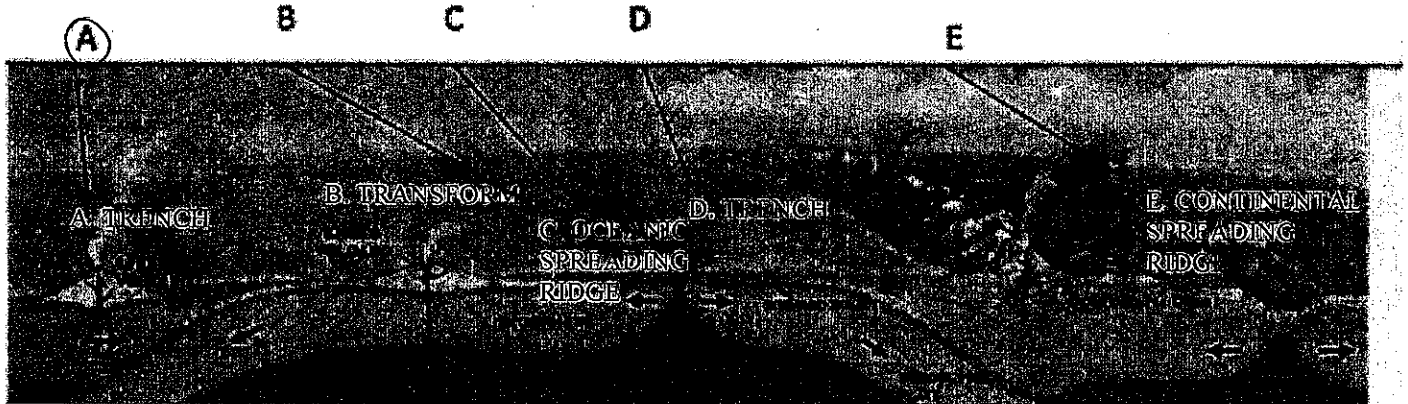
It was only built to withstand an earthquake of 7.9.  
It was not prepared for a shutdown procedure.



STUDENT ID #: A40737921; GROUP #: G

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- A 1. At which boundary is the ocean likely to be deepest?

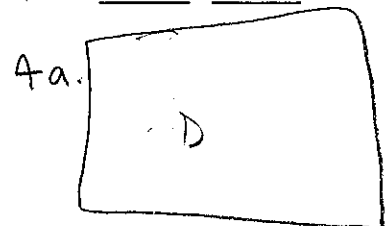


- B 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?
- a. Continental crust does not melt very well at convergent boundaries.
  - ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

- B 3. Which of these carries the most material in streams?
- a. Dissolved load
  - ☒ b. Suspended load
  - c. Bed load

- D 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- ☒ d. A = compaction, B = degassing, C = photosynthesis



- C 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - ☒ c. Continent-ocean convergent boundary

- A 6. Why do continents never subduct under oceans?
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

- C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
- A 8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
- D 9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
- B 10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

both magma erupting (and rising), and a hot air balloon rising are caused by the differences of density between the magma/balloon and its surrounding. The density changes are also both caused by an increase in temperature, making each less dense than their surroundings.

- A B. Which of the following are most similar?
- ☒ a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - c. Respiration and burning coal

Please explain your response to B.:

photosynthesis and respiration are both chemical processes whose energy is transferred from one source to another.

STUDENT ID #: A40732921; GROUP #: 6

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

While the earthquake in Japan was a higher magnitude at a 9.0 than the earthquake in Haiti (about a 7), many more people were killed in Haiti. In Japan, earthquakes are very common as they lay on <sup>of</sup> a subduction, so the Japanese have invested in advanced infrastructure that includes building codes and structures that are built to withstand high magnitude earthquakes. Japan also was very quick to respond to the earthquake and tsunami, warning the residence in danger within 8 minutes. In Haiti, the building codes and structures are not well built, and the people were not properly warned of the disaster, causing much more damage and a higher death toll. The Japan earthquake was pretty close to the surface (24km) which increased the magnitude and caused the tsunami.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

buoyancy is the weight of displaced surroundings by an object.  
the buoyancy force on rising magma changes as the magma rises towards the earth's surface by becoming less buoyant.  
When the magma nears the surface, its thermal energy is transferred to the surrounding rock, cooling the magma slowly causing it to become denser and less buoyant. However, the magma may still be less dense and more buoyant than the surrounding rock, causing it to continue to rise.  
Gas bubbles in the magma may also be released as it nears the surface, also increasing the density and decreasing the buoyancy.

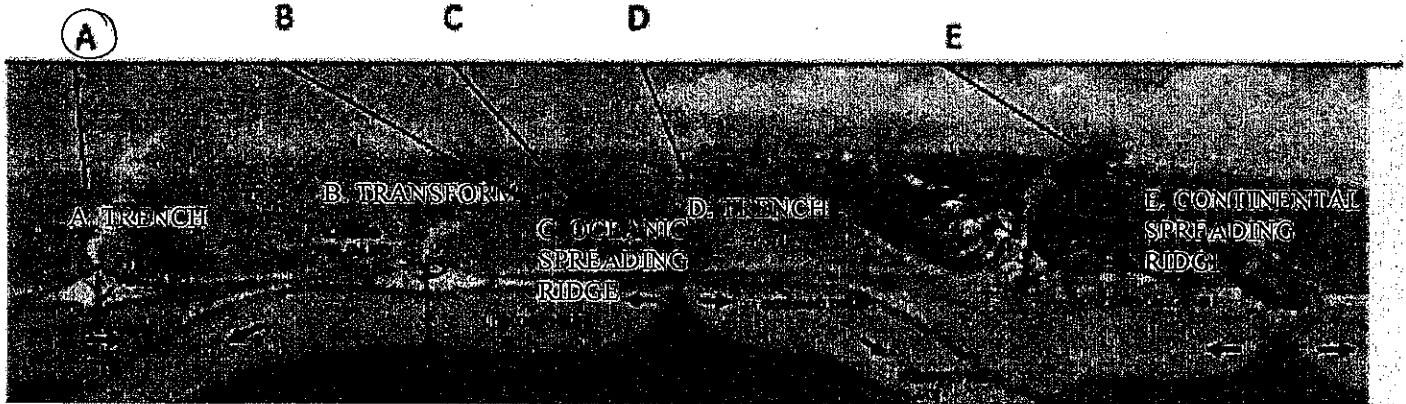
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

It was only built to withstand a 7.9 magnitude earthquake  
It wasn't built to withstand the tsunami water.

STUDENT ID #: A 40659708; GROUP #: G

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

A 1. At which boundary is the ocean likely to be deepest?



B 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

B 3. Which of these carries the most material in streams?

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of compaction, then becomes carbon in the atmosphere through the process of oxidation, and then becomes carbon in plants through the process of photosynthesis.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, c = photosynthesis
- d. A = compaction, B = degassing, c = photosynthesis

A extra credit

C 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

A 6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A 40659708; GROUP #: G

C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
- 8.9

A 8. What type of energy drives slab pull?

- ☒ a. Gravitational energy
- b. Thermal energy
- c. Chemical energy

D 9. Which of the following is the most general correct explanation of buoyancy?

- a. Buoyancy will occur when two materials of differing temperature interact.
- b. Buoyancy will occur when two materials of differing structure interact.
- c. Buoyancy will occur when two materials of differing phase interact.
- ☒ d. Buoyancy will occur when two materials of differing density interact.
- e. Buoyancy will occur when two materials of differing composition interact.

B 10. Which of the following can cause a tsunami?

- a. The movement of seismic waves through water
- ☒ b. The undersea displacement of water
- c. The heating of water during an earthquake

snap back from plate that was "stuck" & displaced water creating a tsunami

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising
- b. Magma erupting and an airplane lifting off
- c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

The magma is hot/less dense than surrounding rocks and buoyancy helps push it up. Like a hot air balloon which rises because of the hot air that is less dense

& rises into the balloon & buoyancy helps raise the balloon.

A B. Which of the following are most similar?

- ☒ a. Photosynthesis and respiration
- b. Photosynthesis and burning coal
- c. Respiration and burning coal

Please explain your response to B.:

Both processes are using/taking in one substance sun/O<sub>2</sub> & releasing another O<sub>2</sub>/CO<sub>2</sub>.

STUDENT ID #: A40659708; GROUP #: G

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- a. A discussion of the approximate magnitudes of each earthquake
  - b. A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

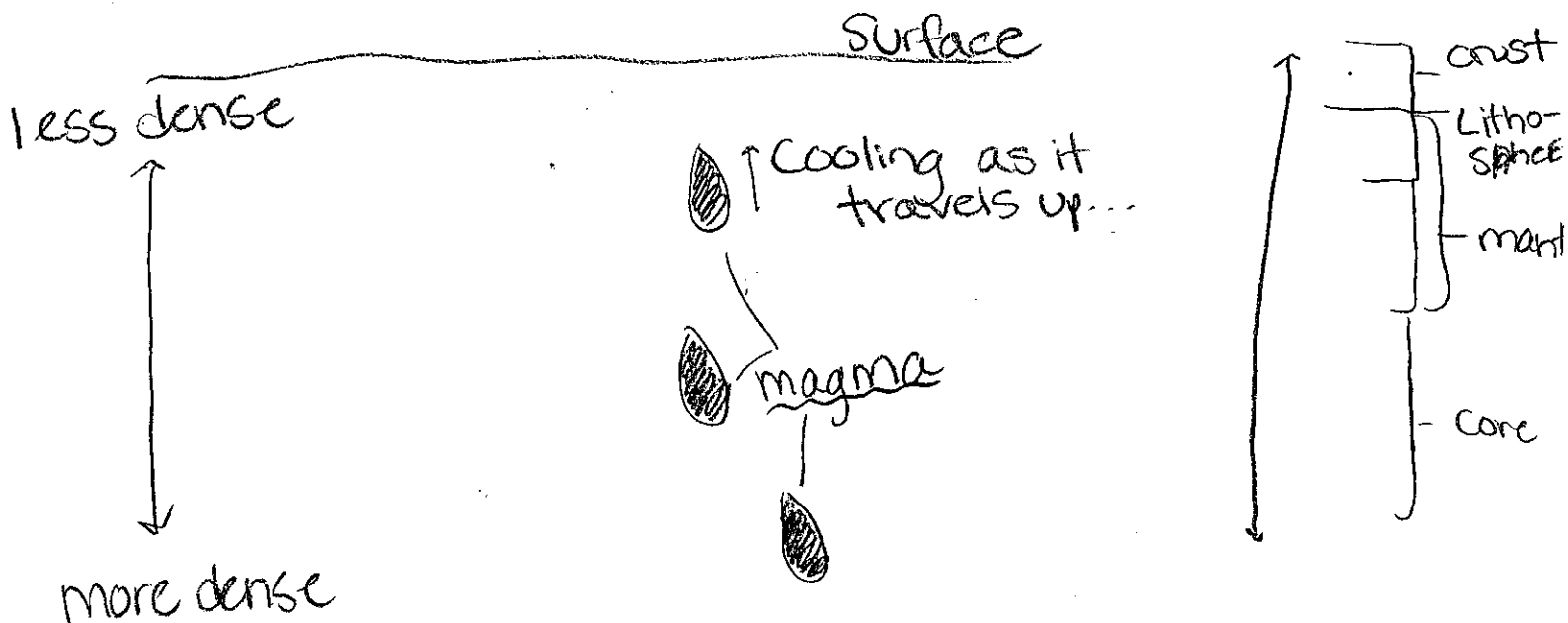
- The Japanese eq. was a higher magnitude than the Haitian eq.
- BUT the Japanese e.q. occurred at a fault line farther away than the Haitian eq.
- Japanese had an 8 min warning signal
- Japanese buildings were made of better materials (steel) & technology that allowed the buildings to sway, not fall
- Haiti's buildings were mostly concrete & were easily destroyed
- Japanese were more educated about e.q. & prevention strategies/survival techniques
- Haiti is a poorer country with little education

STUDENT ID #: A40659708; GROUP #: G

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

- Buoyancy is the differences in density of an object and that of its surrounding
- As magma rises towards the Earth's surface it gets farther away from the core heat/residual heat & starts to cool down, decreasing the difference in densities between the magma & the Earth.
- The colder it gets, the more dense it becomes and less likely to move toward the surface...  
(the magma)



EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

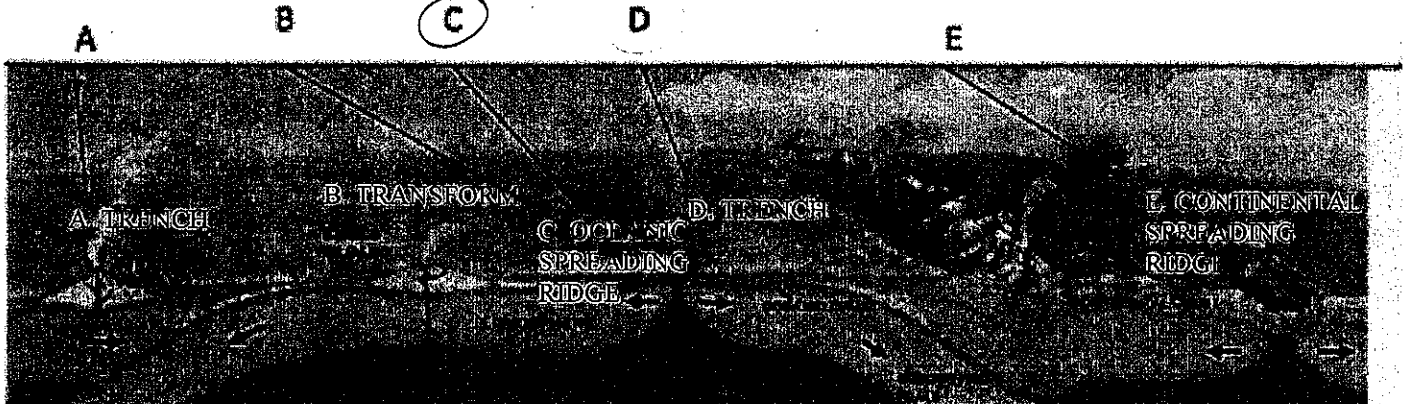
It was only designed to withstand ~ 7/8 magnitude earthquake, also the water from the Tsunami also created problems



STUDENT ID #: A42235241; GROUP #: G

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- ☒ a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- ☒ a. Dissolved load
- b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- ☒ d. A = compaction, B = degassing, C = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- ☒ b. Ocean-ocean divergent boundary
- c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A42235241; GROUP #: 6

- C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?  
a. 7.0  
b. 8.0  
c. 9.0  
d. 10.0
- A 8. What type of energy drives slab pull?  
a. Gravitational energy  
b. Thermal energy  
c. Chemical energy
- D 9. Which of the following is the most general correct explanation of buoyancy?  
a. Buoyancy will occur when two materials of differing temperature interact.  
b. Buoyancy will occur when two materials of differing structure interact.  
c. Buoyancy will occur when two materials of differing phase interact.  
d. Buoyancy will occur when two materials of differing density interact.  
e. Buoyancy will occur when two materials of differing composition interact.
- B 10. Which of the following can cause a tsunami?  
a. The movement of seismic waves through water  
b. The undersea displacement of water  
c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A A. Which of the following are most similar?  
a. Magma erupting and a hot air balloon rising  
b. Magma erupting and an airplane lifting off  
c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

They are both lifted due to buoyancy. The magma is less dense than the surrounding rock so it rises. The hotter air in the balloon is less dense than the colder air around the balloon so it rises.

- C B. Which of the following are most similar?  
a. Photosynthesis and respiration  
b. Photosynthesis and burning coal  
c. Respiration and burning coal

Please explain your response to B.:

Both respiration and burning coal are processes that are done to gain energy. They also both give off heat as a result.

STUDENT ID #: A42235241 ; GROUP #: 6

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The earthquake in Haiti was of around a 7.1 magnitude while the earthquake in Japan was of around a 9.0 magnitude. One of the things that made the earthquake in Haiti much deadlier was that it happened in a much closer proximity to the mainland, while the Japan earthquake happened off the coast and the majority of the damage was done by the Tsunami that followed.

Japan was also much better prepared for the tragedy which allowed for a much lower death toll. Japan is a developed, relatively wealthy and high-tech nation. To a certain degree they had taken precautions and built safer buildings, meant to withstand earthquakes. They also had a quicker response, and somewhere to evacuate to. Haiti, being a relatively small, developing country, did not have these luxuries. They were defenseless and essentially had no place to evacuate to.

STUDENT ID #: A42235241; GROUP #: G

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy is when one substance is less dense than another substance, causing it to rise. It is what drives convection in the hydrosphere, atmosphere and the mantle. It allows for substance to be renewed and recycled.

Magma begins to rise because it is hotter than the rock around it, making it less dense. As it rises, the magma begins to cool, making it more dense and therefore affecting its buoyancy. It can then erupt when it reaches the earth's surface where it cools, forming igneous rocks and even whole islands.

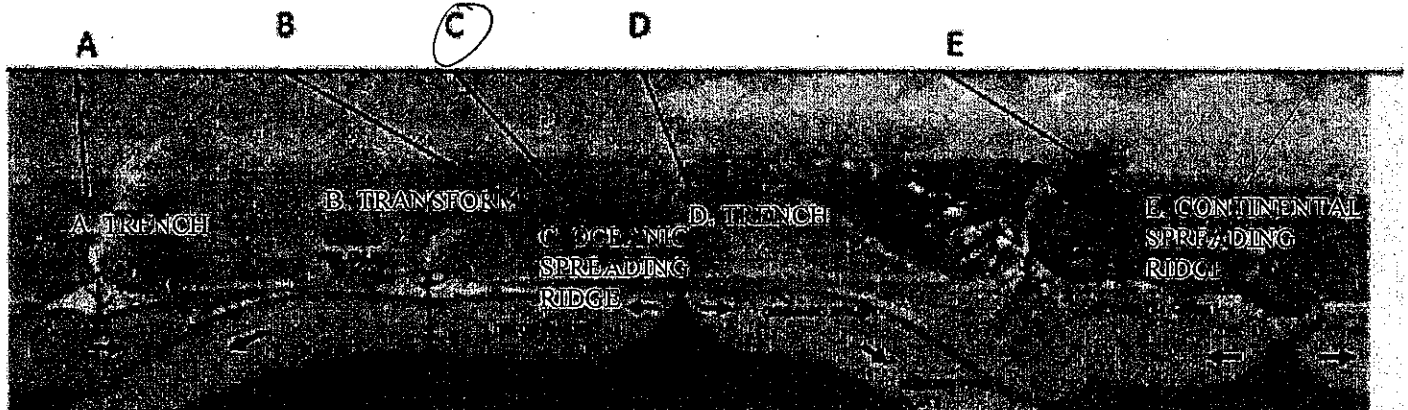
Magma is formed when water is pushed out of rocks beneath the surface, and is super heated

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake? The sheer onslaught of the earthquake, tsunami and fires were too much to handle. The workers had evacuated and could not take measures to stop the leaks.

STUDENT ID #: A4398990; GROUP #: 6

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- ☒ a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

☒ 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- ☒ c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- ☒ a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
Both rise due to heating and becoming less dense.

- B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:  
Both create  $\text{CO}_2$  as a product in their chemical equation.

STUDENT ID #: A41398990; GROUP #: 6

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

Despite Haitian Earthquake Magnitude only being 7 and Japan's devastating earthquake being close to 9 the Haitian earthquake killed more people because the buildings were made only of concrete. If their buildings contained steel, their buildings would be able to withstand (like Japan's did)

More chaos during their earthquake. But since their economy isn't as strong, they chose only to build concrete because of tsunamis.

STUDENT ID #: 123; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy is the way a solid can float on a liquid relative to its density.

When magma is formed it is hotter than the surrounding rock making it less dense than everything else. Because the magma's density is less, its buoyancy will increase moving that magma upward.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

- The nuclear power plant in Japan was made only to withstand 7.9 earthquake.



A40250026

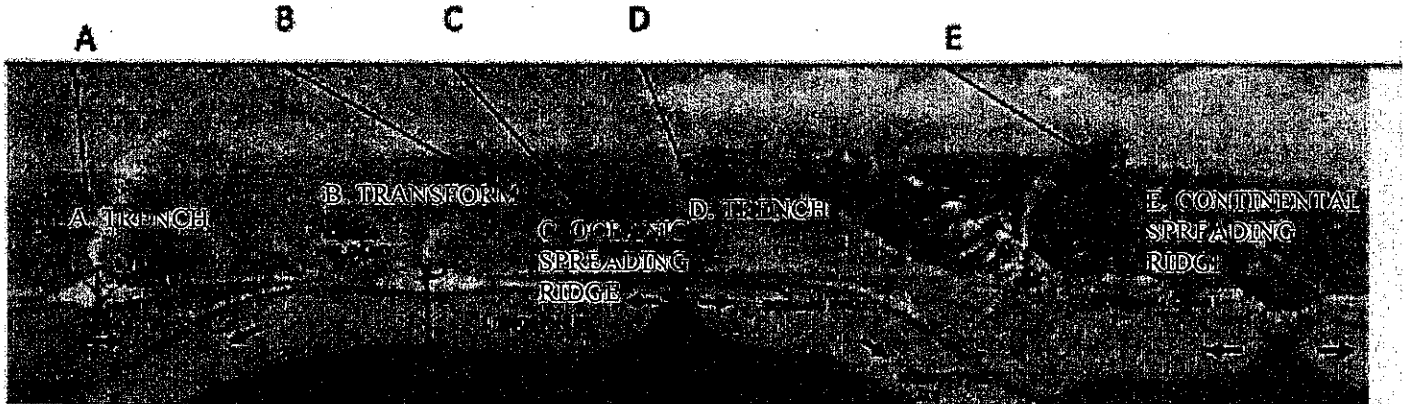
ISP 203A: GLOBAL CHANGE  
EXAM #2; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: [REDACTED]; GROUP #: H

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

D 1. At which boundary is the ocean likely to be deepest?



B 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?  
a. Continental crust does not melt very well at convergent boundaries.  
b. Continental crust is so thick that melt cools before it reaches the surface.  
c. Continental crust overlies mantle that is too cold for much melting to occur.

B 3. Which of these carries the most material in streams?  
a. Dissolved load  
b. Suspended load  
c. Bed load

C 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

Question 4A

A

A 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?  
a. Ocean-continent transform boundary  
b. Ocean-ocean divergent boundary  
c. Continent-ocean convergent boundary

C 6. Why do continents never subduct under oceans?  
a. Continental rocks are less dense than oceanic rocks.  
b. Oceanic rocks are less dense than continental rocks.  
c. Continental rocks are warmer than oceanic rocks.  
d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

- C ~~8~~ 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - c. 9.0
  - d. 10.0
- A 8. What type of energy drives slab pull?
- a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
- D 9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
- A 10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.: C  
Because the balloon rising and airplane lifting has the same amount of current and they both are being raised higher than they started off at

- B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - c. Respiration and burning coal

Please explain your response to B.: A  
They are similar because both of these are processes to start something new and get more collected of an item at different times

STUDENT ID #: A40250026; GROUP #: H

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:

- A discussion of the approximate magnitudes of each earthquake
- A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The earthquake with the Haitian was much deadlier than Japanese earthquake because Japan is a wealthy country and is very equipped for instances as an earthquake. All of their buildings have equipped earthquake material set up and they have technology systems that can warn you in up to 8 min. Now the Haitian earthquake on the other hand they are less wealthy and do not have the proper equipment for an earthquake they can not afford as many technical items as Japan. Even though both earthquakes magnitudes were about the same Japanese pulled through while Haitian is still suffering.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

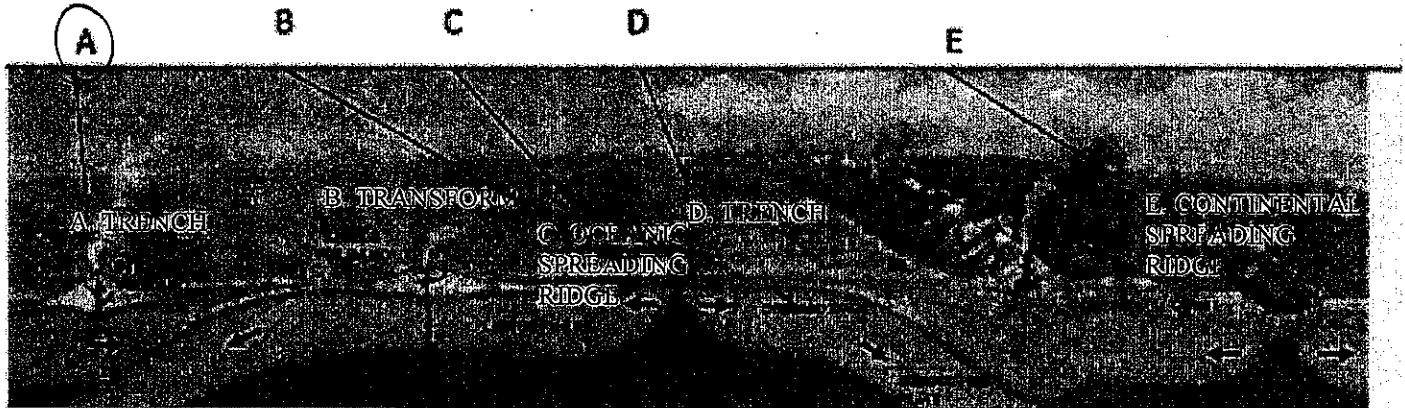
buoyant force changes as magma rises towards Earth's surface due to the fact of evaporation of the magma and the tendency of the pressure that the buoyancy has on the earth's surface. Buoyancy is the occurrence of two objects contracting at a different density amount. And the magma rising towards the earth's surface and the buoyant force on a rising magma is two completely density's as it is subject to change.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake? Mainly because the power plant was equipped with the mind set of ~~acting with~~ transformation and gravitational energy, stating that we have the equipment to with hold so they tried to not act accordingly.

STUDENT ID #: A40861547; GROUP #: H

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

A1. At which boundary is the ocean likely to be deepest?



C2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- ☒ c. Continental crust overlies mantle that is too cold for much melting to occur.

C3. Which of these carries the most material in streams?

- a. Dissolved load
- b. Suspended load
- ☒ c. Bed load

1A: B  
4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- ☒ b. A = burial, B = respiration, C = weathering
- ☒ c. A = burial, B = oxidation, C = photosynthesis
- ☒ d. A = compaction, B = degassing, C = photosynthesis

C5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- ☒ b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

A6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- ☒ b. Oceanic rocks are less dense than continental rocks.
- ☒ c. Continental rocks are warmer than oceanic rocks.
- ☒ d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A40861547; GROUP #: H

- C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
- A 8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
- D 9. Which of the following is the most general correct explanation of buoyancy?
- ☒ a. Buoyancy will occur when two materials of differing temperature interact.
  - ☒ b. Buoyancy will occur when two materials of differing structure interact.
  - ☒ c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - ☒ e. Buoyancy will occur when two materials of differing composition interact.
- B 10. Which of the following can cause a tsunami?
- ☒ a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - ☒ c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

as both heat up they  
begin to rise and as they  
cool they sink

- C B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:

both are oxidizing and  
taking in energy to produce  
CO<sub>2</sub> and heat

STUDENT ID #: F40861547; GROUP #: H

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Haiti earthquake was about a 7.0 however it was more devastating because Haiti is not as wealthy as Japan to build buildings that can withstand earthquakes and tsunamis.

Japan's buildings are built on springs so when there is an earthquake, they just rock/sway back and forth whereas in Haiti they do not have the resources to do that.

Also in Japan buildings are made out of concrete reinforced with steel to help the structure withstand a tsunami. Whole buildings were moved, rather than crumbled and destroyed. In Haiti, they do not have the money or resources to do that so they are destroyed.

Japan is also further ahead in technology than Haiti so when the earthquake hit they were able to send out alerts through sirens and messages (to people's cell phones for example) to alert people they should get to higher ground to prepare for tsunami. They had 8 whole minutes of knowing what was about to happen. In Haiti, a 3<sup>rd</sup> world country, the people are not lucky enough to have those resources so they do not know.

STUDENT ID #: A40861547; GROUP #: H

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy will occur when two materials of different density interact. The less dense one will rise above the more dense material that will sink. <sup>"float"</sup>

As a material heats up, it becomes less dense causing it to rise which is how magma (which is melted rock) gets to the Earth's surface. The asthenosphere pushes it out due to its heat.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

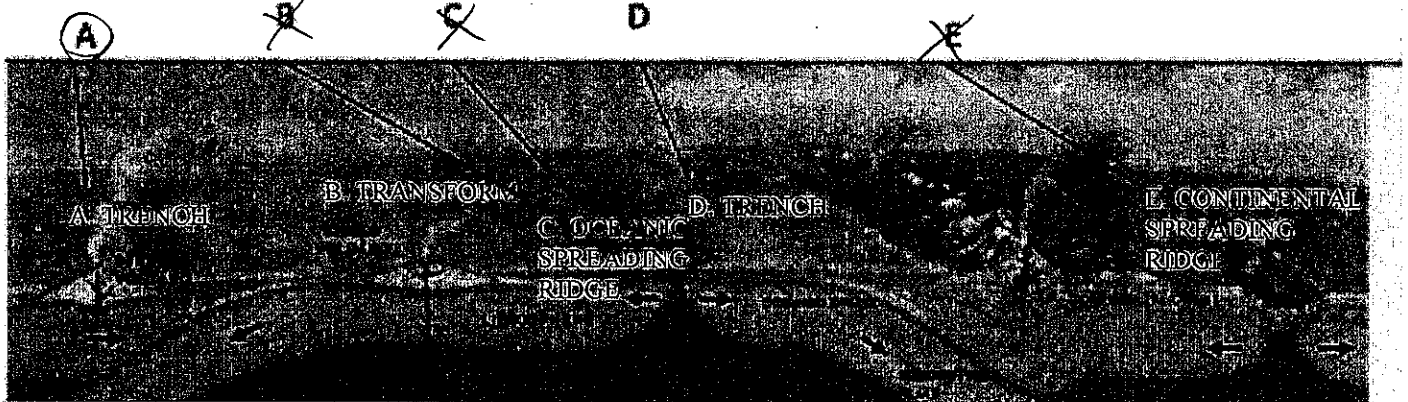
- the rods that are supposed to stay cool at all times got hot
- they were built to withstand the most destructive EQ that has ever occurred in Japan (max 8.0), not most destructive in world ever seen



STUDENT ID #: A45139440; GROUP #: H

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- C
- a. Continental crust does not melt very well at convergent boundaries.
  - ~~b. Continental crust is so thick that melt cools before it reaches the surface.~~
  - ☒ c. Continental crust overlies mantle that is too cold for much melting to occur.  
*there is no water interaction*

3. Which of these carries the most material in streams?

- B
- a. Dissolved load
  - ☒ b. Suspended load
  - c. Bed load

A

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, c = photosynthesis
- d. A = compaction, B = degassing, c = photosynthesis

4a. D

C

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

A

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- ~~b. Oceanic rocks are less dense than continental rocks.~~
- c. Continental rocks are warmer than oceanic rocks.
- ~~d. Oceanic rocks are warmer than continental rocks.~~

same thing??

STUDENT ID #: A45139440; GROUP #: A1

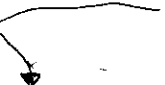
7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- C
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0

8. What type of energy drives slab pull?

- A
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy

Cold,  
dense



9. Which of the following is the most general correct explanation of buoyancy?

- D
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- B
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- A
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Buoyancy!  
both are seeking equilibrium  
due to density differences —  
thermal.

Please explain your response to A.: ☒ A  
the less dense magma rises  
through the denser rock —  
the warmer, less dense hot  
air balloon rises up through  
the denser, cold air.

B. Which of the following are most similar?

- C
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.: ☒ C  
respiration is a release of  
energy — just as burning  
coal is. Both release  
carbon dioxide.

STUDENT ID #: A45139440; GROUP #: H

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Japan earthquake was a 9.0 magnitude while the Haitian quake was only a 7.0 magnitude quake, yet the Haitian earthquake killed about 300,000 people. The most significant reason the Haitian quake was more destructive and deadlier is that their buildings were built primarily to withstand hurricanes: made of cement w/no steel reinforcements because Haiti is a poor country and steel is not cheap. Japan regularly experiences quakes and has designed their buildings to withstand them, complete with foundational "springs." Japan is a rich and developed country that has procedures and policies in place so they can respond quickly and effectively to an earthquake. Haiti was caught off guard and ill prepared for this type of disaster - many died post-earthquake from a lack of necessary medical care, water, etc.

STUDENT ID #: A45139440; GROUP #: H

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

seeking equilibrium Buoyancy is the force a material experiences; comparing its density with the surrounding material. As a (liquid) magma rises through solid rock in the mantle, the gravitational pressure decreases and the magma seeks equilibrium in terms of density and buoyancy. The solid rock/mantle is most dense and the magma less, with the Earth's surface being even less dense.

The buoyancy changes as the magma rises because the relative density of the surrounding material changes (the rock closer to the surface is warmer). That and as the magma rises, it degasses which makes it "bubble" and the magma cools a little, making it slightly denser than it was.

plus! As it rises and pressure is released, the magma spreads out and that would cause density to decrease instead.

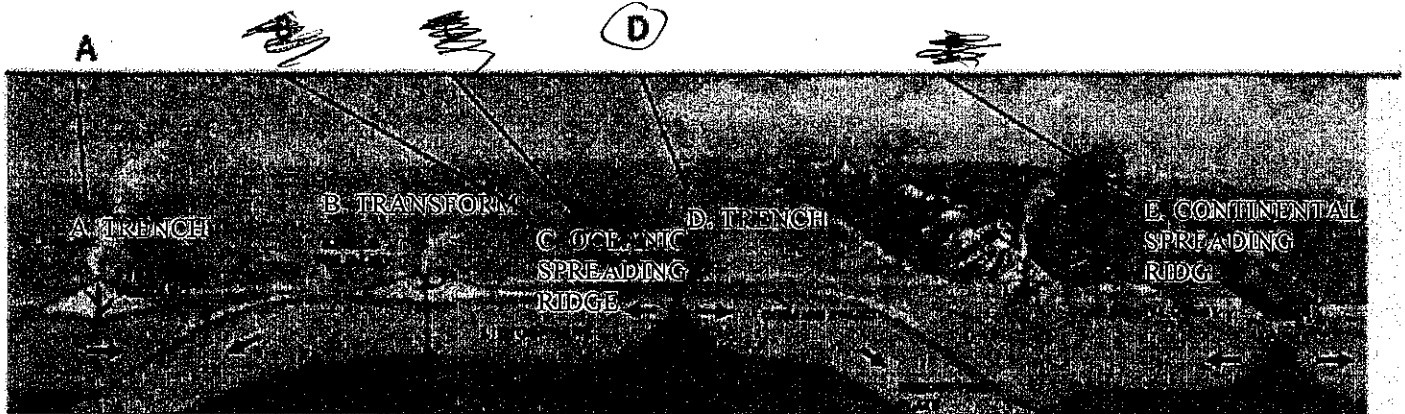
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

- they built the plant to withstand a 7.9 quake
- they had a cheap containment shield that failed
- they built it to withstand an earthquake but not a large tsunami.

STUDENT ID #: A41696110; GROUP #: I

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- B
- a. Continental crust does not melt very well at convergent boundaries.
  - ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- B
- a. Dissolved load
  - ☒ b. Suspended load
  - c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

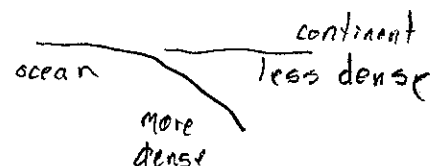
- A
- ☒ a. A = compaction, B = oxidation, C = photosynthesis
  - b. A = burial, B = respiration, C = weathering
  - c. A = burial, B = oxidation, C = photosynthesis
  - d. A = compaction, B = degassing, C = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- C
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- A
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.



STUDENT ID #: A41696116; GROUP #: I

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- C  
a. 7.0  
b. 8.0  
c. 9.0  
d. 10.0

8. What type of energy drives slab pull?

- A  
a. Gravitational energy  
b. Thermal energy  
c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- D  
a. Buoyancy will occur when two materials of differing temperature interact.  
b. Buoyancy will occur when two materials of differing structure interact.  
c. Buoyancy will occur when two materials of differing phase interact.  
d. Buoyancy will occur when two materials of differing density interact.  
e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- A  
a. The movement of seismic waves through water  
b. The undersea displacement of water  
c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- a. Magma erupting and a hot air balloon rising  
b. Magma erupting and an airplane lifting off  
c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

These are similar because both deal with a material being less dense than it's surrounding, and thus rising

B. Which of the following are most similar?

- B  
a. Photosynthesis and respiration - opposites  
b. Photosynthesis and burning coal  
c. Respiration and burning coal

Please explain your response to B.:

Photosynthesis & burning coal both use burning of carbon to create energy.

STUDENT ID #: A41696110; GROUP #: III

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake 7 vs. 9
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Haitian earthquake was much deadlier than the Japanese earthquake for several reasons. First, the location of the Haitian earthquake relative to the country made it worse. The earthquake took place right beneath the nation, while the Japanese earthquake took place off the coast of Japan. Even though the Japanese earthquake was 100 times stronger than the Haitian earthquake with a magnitude of 9.0 versus 7.0, the proximity of the Haitian earthquake made it deadlier. Secondly, there were socioeconomic & environmental factors that contributed to a difference in death tolls. Haiti, being a more or less third world country, did not have the resources to prepare its country adequately. They are more used to hurricanes, and thus most of their buildings are made of concrete. Concrete is more susceptible to breaking & crumbling during an earthquake. In Japan, they have higher building codes that allowed their buildings to withstand massive earthquakes. Since Japan is also a fairly wealthy country, they were able to better prepare and have the care needed to assist during an earthquake. In conclusion, even though the Haitian earthquake was smaller than the Japanese, the proximity of the quakes and the socioeconomic & environmental factors contributed to a much higher death toll in Haiti.

STUDENT ID #: A41696110; GROUP #: I

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

The buoyant force on a rising magma changes as the magma rises towards the Earth's surface. This is due to a differing in densities. Buoyancy works when one material is more or less dense than the other. For example, we have an ice cube being held by an outside force at the bottom of a pool of water. If we let the ice cube go, it will float to the top. This is because the ice cube is less dense than the surrounding water. As the ice cube rises, the surrounding water replaces it and acts as a force beneath it, pushing the ice cube upwards towards the surface. The same concept of buoyancy applies to magma as it rises, however, the force changes as it rises. This happens because the hot magma cools as it rises to the surface. With temperature change comes density change; the higher the temperature, the lower the density. Thus, as the magma is rising and cooling, its density is increasing. Buoyancy says that the more dense an object is versus its environment, the less buoyant force is acting on that object. In conclusion, the buoyancy is changing as the magma rises because it is becoming more dense as it cools.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

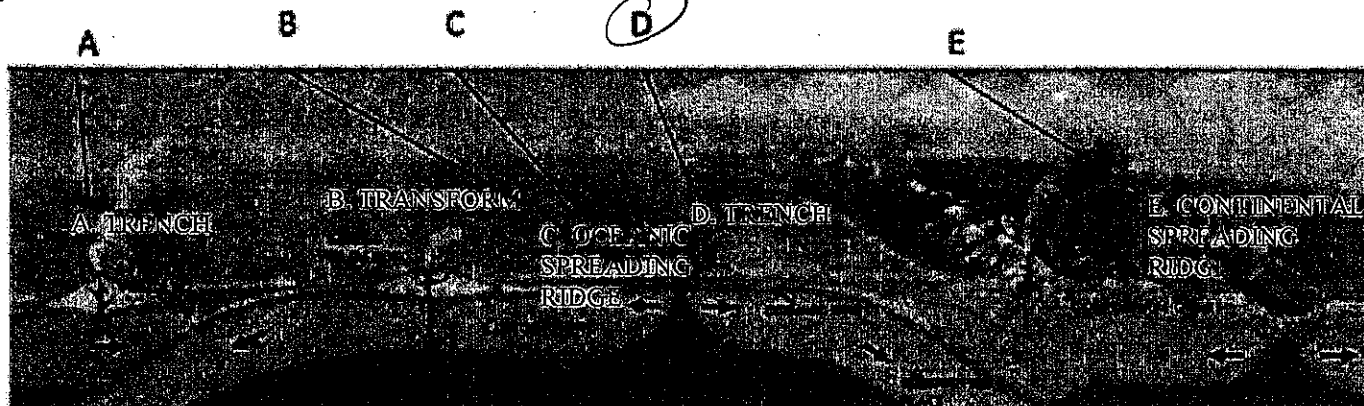
Two reasons the nuclear plant in Japan failed to withstand the earthquake are that the walls of the containment shell were not thick enough to withstand the tsunami, and also that hydrogen building up in the reactors caused explosions and fires. Also, loss of back-up power led to failure.



STUDENT ID #: A40840884; GROUP #: I

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- D 1. At which boundary is the ocean likely to be deepest?



- B 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?
- a. Continental crust does not melt very well at convergent boundaries.
  - b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

- C 3. Which of these carries the most material in streams?
- a. Dissolved load
  - b. Suspended load *70%*
  - c. Bed load *which all*

- A D A 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.
- a. A = compaction, B = oxidation, C = photosynthesis
  - b. A = burial, B = respiration, C = weathering
  - c. A = burial, B = oxidation, C = photosynthesis
  - d. A = compaction, B = degassing, C = photosynthesis

- C 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - c. Continent-ocean convergent boundary

- A 6. Why do continents never subduct under oceans? *all about density*
- a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A40840884; GROUP #: I

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- a. 7.0
- b. 8.0
- ☒ c. 9.0
- d. 10.0

8. What type of energy drives slab pull?

- ☒ a. Gravitational energy
- b. Thermal energy
- c. Chemical energy

*pulling to crust  
composition, too  
density*

*density = weight*

9. Which of the following is the most general correct explanation of buoyancy?

- a. Buoyancy will occur when two materials of differing temperature interact.
- b. Buoyancy will occur when two materials of differing structure interact.
- c. Buoyancy will occur when two materials of differing phase interact.
- ☒ d. Buoyancy will occur when two materials of differing density interact.
- e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- a. The movement of seismic waves through water
- ☒ b. The undersea displacement of water
- c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- a. Magma erupting and a hot air balloon rising
- ☒ b. Magma erupting and an airplane lifting off
- c. A hot balloon rising and an airplane lifting off

Please explain your response to A.: *The magma becomes more dense, so after the initial burst it's pushed skyward. It's like take off of a plane is this explosion of energy from the engine, the plane reaches a certain height & levels off.*

B. Which of the following are most similar?

- a. Photosynthesis and respiration
- b. Photosynthesis and burning coal
- ☒ c. Respiration and burning coal

Please explain your response to B.:

*Both release CO<sub>2</sub>*

STUDENT ID #: 140840884; GROUP #: I

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Japanese earthquake was had a magnitude of 9, which was 100x more than the Haitian earthquake of 7. Despite the Japanese earthquake causing a tsunami & the ~~greater~~ magnitude, the Haitian earthquake was deadlier due to the difference in infrastructure. Japan has buildings made of steel & foundations ~~entirely~~ with rubber. Haiti is a poorer country, so its structures are made of concrete. Besides being a poorer country than Japan, Haiti did have a good ~~environment~~ reason for using concrete. Haiti had concrete buildings, so flooding could occur during hurricanes, the water ~~goes~~ <sup>would</sup> back down, & the buildings would be fine. The buildings made to protect Haitians collapsed on many people, due to the earthquake. Japan had tsunami barriers, a good warning system, & good infrastructure. Due to Haiti's lack of infrastructure, 300,000 people died compared to Japan's growing death toll, which is at 26,000.

STUDENT ID #: 1408408511; GROUP #: I

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

a) Buoyancy is caused due to the <sup>change of composition</sup> ~~hydrofracture~~ <sup>or, the magma is lower density, the rock higher, so magma rises.</sup> ~~causing lower density, thus creating magma & the~~ <sup>higher density surrounding rock / atmosphere</sup>

b) Buoyancy changes when magma rises due to eruption of the magma. The magma erupts because the gas which was put in it when it's composition changed from rock into magma, ~~degrades~~ <sup>degasses</sup> from the magma. The magma's ascent is slowed, but not stopped. This is because the magma still has more density than the surround (lithospheric) rock. Therefore, the magma had a high buoyancy, the buoyancy was lowered during degassing, but the magma stayed buoyant bc the surrounding rock was denser, & continued to rise.

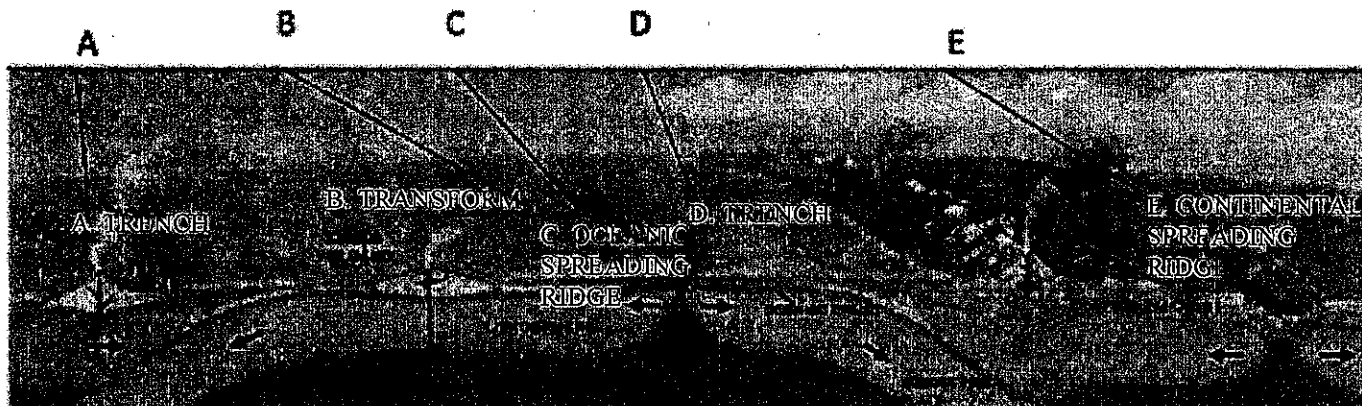
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

① It was built at the ocean, tsunamis had happened there before. They shouldn't have built it there. ② It was built to withstand an 8.5, but not 9 earthquake.

STUDENT ID #: A420971140; GROUP #: I

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- a. 7.0
- b. 8.0
- c. 9.0
- d. 10.0

8. What type of energy drives slab pull?

- a. Gravitational energy
- b. Thermal energy
- c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- a. Buoyancy will occur when two materials of differing temperature interact.
- b. Buoyancy will occur when two materials of differing structure interact.
- c. Buoyancy will occur when two materials of differing phase interact.
- d. Buoyancy will occur when two materials of differing density interact.
- e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- a. The movement of seismic waves through water
- b. The undersea displacement of water
- c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- a. Magma erupting and a hot air balloon rising
- b. Magma erupting and an airplane lifting off
- c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

the balloon and the magma are both less dense than the air and surrounding rocks, therefore they rise

B. Which of the following are most similar?

- a. Photosynthesis and respiration
- b. Photosynthesis and burning coal
- c. Respiration and burning coal

Please explain your response to B.:

respiration and burning both release energy.

STUDENT ID #: A42097140; GROUP #: I

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Haitian earthquake was much deadlier than the Japanese earthquake for many reasons. The first being the rate at which each earthquake received on the Richter scale. This scale measures the severity and power of earthquakes. The Haitian earthquake received a 9.10 on the Richter scale and the Japanese earthquake received an 8.10. This means that the Haitian earthquake was more powerful.

The Haitian earthquake was also deadlier because it was a smaller island in which water could enter. The water had to travel less distance to destroy land on Haiti than Japan because of its size. Also, Haiti is a country of little wealth so affording rescue crews and medical help to the wounded was difficult. Due to these facts, Haiti experienced more damage from their earthquake than Japan did.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Bouyancy is the tendency for things to float in a liquid due to the differences in density. Bouyancy will change as magma rises because the magma is less dense than the sediments around it, therefore making density decrease. Also, as the magma rises, it begins to cool down, so the density of the magma decreases (hotter substances have higher densities), in turn increasing the bouyancy.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

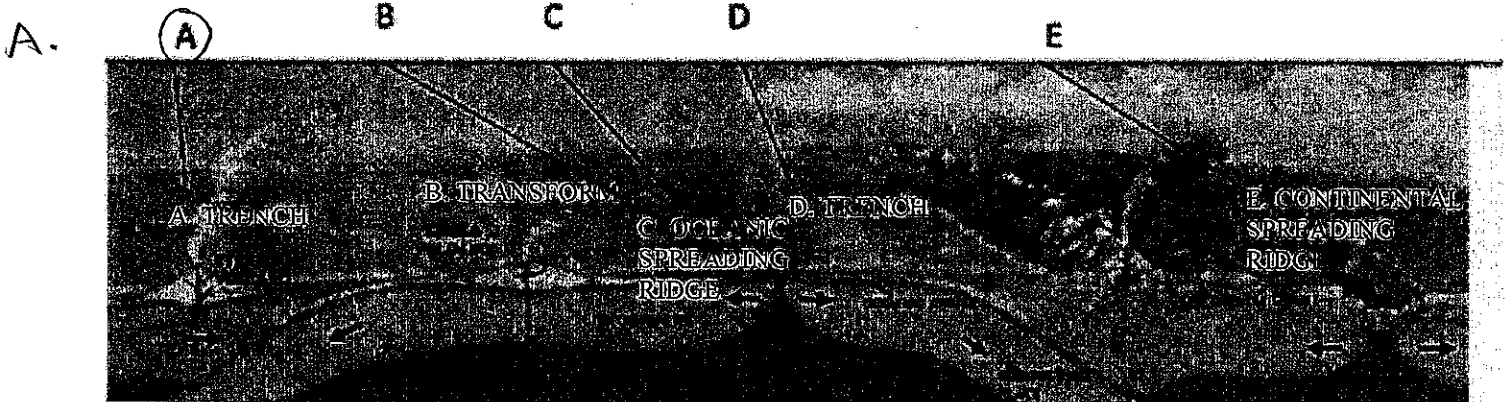
magnitude of the earthquake. lack of warning signs



STUDENT ID #: A40006739; GROUP #: I

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- B. ☐ a. Continental crust does not melt very well at convergent boundaries.  
☒ b. Continental crust is so thick that melt cools before it reaches the surface.  
☐ c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- B. ☐ a. Dissolved load  
☒ b. Suspended load  
☐ c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- A. ☒ a. A = compaction, B = oxidation, C = photosynthesis  
☐ b. A = burial, B = respiration, C = weathering  
☐ c. A = burial, B = oxidation, C = photosynthesis  
☒ d. A = compaction, B = degassing, C = photosynthesis

4 A. D.

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- B. ☐ a. Ocean-continent transform boundary  
☒ b. Ocean-ocean divergent boundary  
☐ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- A. ☒ a. Continental rocks are less dense than oceanic rocks.  
☐ b. Oceanic rocks are less dense than continental rocks.  
☐ c. Continental rocks are warmer than oceanic rocks.  
☐ d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A40006739; GROUP #: I

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- ☐ a. 7.0  
☒ b. 8.0      8.9  
☐ c. 9.0  
☐ d. 10.0

8. What type of energy drives slab pull?

- ☒ a. Gravitational energy  
☐ b. Thermal energy  
☐ c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- ☐ a. Buoyancy will occur when two materials of differing temperature interact.  
☐ b. Buoyancy will occur when two materials of differing structure interact.  
☒ c. Buoyancy will occur when two materials of differing phase interact.  
☐ d. Buoyancy will occur when two materials of differing density interact.  
☐ e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- ☐ a. The movement of seismic waves through water  
☒ b. The undersea displacement of water  
☐ c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising  
☐ b. Magma erupting and an airplane lifting off  
☐ c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

A hot air balloon is less dense than the air surrounding it, and the magma is less dense than the surrounding rock causing them both to rise.

B. Which of the following are most similar?

- ☐ a. Photosynthesis and respiration  
☐ b. Photosynthesis and burning coal  
☒ c. Respiration and burning coal

Please explain your response to B.:

Respiration and burning coal are similar because they are both releasing energy into the atmosphere

STUDENT ID #: A40006739; GROUP #: I

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

Although the Haitian earthquake was a lesser magnitude than the 8.9 magnitude earthquake in Japan, it still killed more people. The main reason for this was due to the structure and how prepared each country was. In Haiti the buildings were mostly made out of cement which was very easy to be destroyed by an earthquake. In Japan the buildings were ready for such an earthquake. The buildings were made out of steel, and beneath each building, especially skyscrapers, they built in springs so that the buildings could withstand the movement of the earth without falling down. Also, in Japan the citizens were educated with emergency procedures so they knew exactly what to do for themselves and for others to stay alive.

STUDENT ID #: A40006739; GROUP #: I

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy is a phenomenon that happens when one substance is less dense than its surrounding substance.

Buoyancy changes when magma rises because of the gaseous bubbles inside of the magma. Deep down, beneath the Earth's surface the magma is hot and has many gas bubbles making it less dense; ~~and~~ more buoyant. As the magma rises the rock becomes cooler and cooler, and the gas bubbles begin to leak out of the magma. This causes the density of the magma to increase and slow its ascent to the Earth's surface. However, as long as the magma is less dense than the surrounding rock, it will continue to rise.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

1. only built to withstand a 7.9 magnitude earthquake.
2. Was built in a bad location more susceptible to earthquakes

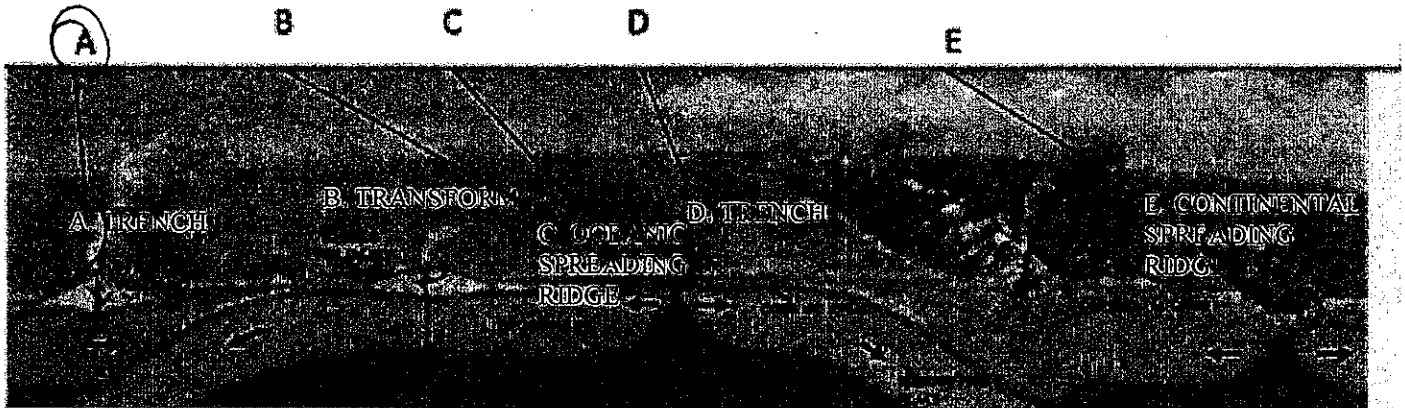
ISP 203A: GLOBAL CHANGE  
EXAM #2; Sibley/Libarkin, Spring 2011; 100 points

I

STUDENT ID # A42601752; GROUP #: J

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

A 1. At which boundary is the ocean likely to be deepest?

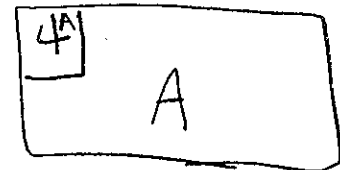


2. Why does very little volcanic activity occur at continent-continent convergent boundaries?
- a. Continental crust does not melt very well at convergent boundaries.
  - b. Continental crust is so thick that melt cools before it reaches the surface.
  - ☒ c. Continental crust overlies mantle that is too cold for much melting to occur.

- B 3. Which of these carries the most material in streams?
- a. Dissolved load
  - ☒ b. Suspended load
  - c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- ☒ c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis



- B 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?
- ☒ a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - c. Continent-ocean convergent boundary

- A 6. Why do continents never subduct under oceans?
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A42601752; GROUP #: J

- B 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - ☒ b. 8.0
  - c. 9.0
  - d. 10.0
- A 8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
- D 9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
- B 10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

Both magma + hot air balloon are less dense than the surrounding matter so they will rise due to the surrounding matter going under it & pushing it upwards.

- C B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:

Both respiration + burning coal take basic sugar and turn it into oxygen and water.

STUDENT ID #: A42601752; GROUP #: J

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

Even though the magnitude of the earthquake that took place in Haiti was less than the one in Japan, the effects were larger and more deadly. This is due to the fact that Haiti is one of the lowest socioeconomic places in the world and they were not educated enough to know how to handle the situation of an earthquake. Japan on the other hand knew what needed to be done in order to survive and not have as many deaths as Haiti experienced. The environment in Japan is more modern and reliable than that in Haiti which is also a factor as to why Haiti experienced the earthquake in a harsher and deadlier manner.

STUDENT ID #: A42601752; GROUP #: J

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy is the correlation between densities. So as one object becomes less dense, it is able to rise above the more dense object. With the right heat and pressure the buoyancy of magma increases so its able to rise upward. The surrounding matter is more dense than the magma so it goes under the magma forcing it to rise & become more buoyant. If the buoyancy of the magma decreases it will slow significantly or stop depending on the relationship of its density and the surrounding matter.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

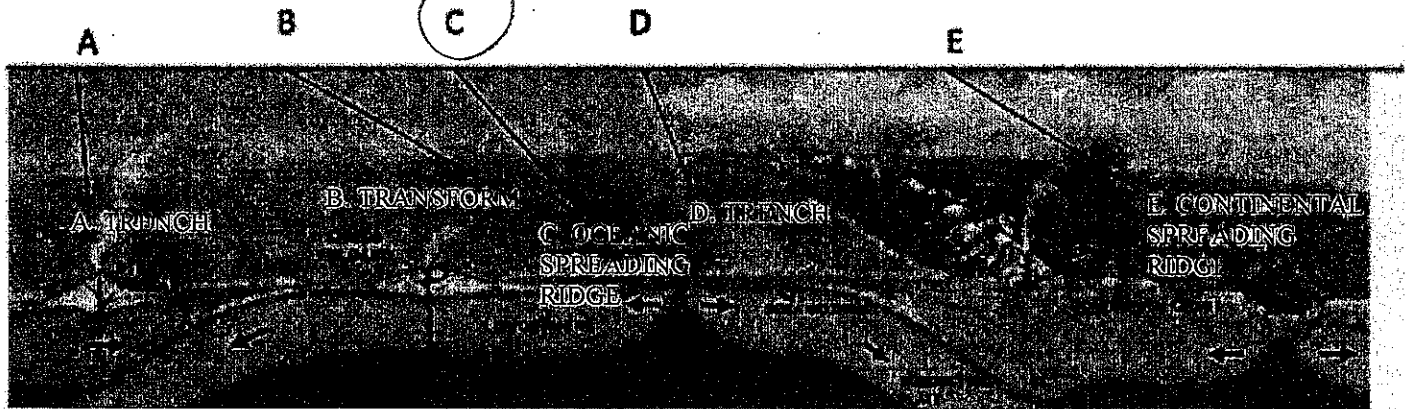
The earthquake's magnitude was just too strong. Nuclear power plants are built to only withstand a certain degree of magnitude & the earthquake in Japan was too large for it to withstand it.



STUDENT ID #: A43338446; GROUP #: 1

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- C 1. At which boundary is the ocean likely to be deepest?



- B 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?
- a. Continental crust does not melt very well at convergent boundaries.
  - ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

- C 3. Which of these carries the most material in streams?
- a. Dissolved load
  - b. Suspended load
  - ☒ c. Bed load

- A 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

QUESTION 4A:  
C

- A 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?
- ☒ a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - c. Continent-ocean convergent boundary

- C 6. Why do continents never subduct under oceans?
- a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - ☒ c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A43338446; GROUP #: J

- C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - c. 9.0
  - d. 10.0
- A 8. What type of energy drives slab pull?
- a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
- D 9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
- A 10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A A. Which of the following are most similar?
- a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

Both the magma and the hot air balloon are raised by heat.

- A B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - c. Respiration and burning coal

Please explain your response to B.:

Both processes take in oxygen and use it to function.

STUDENT ID #: A433384410; GROUP #: J

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

Although the magnitude of the earthquake in Japan was 9.0, much larger than the Haitian earthquake, the infrastructure in Japan was much stronger and more prepared for natural disaster. The economy in Haiti did not allow for them to make strong enough buildings to withstand an earthquake, causing more homes, buildings, and other objects to crumble, which ultimately caused more deaths.

STUDENT ID #: A433384410; GROUP #: 1

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy is caused by the difference in density between substances. Substances with higher density have a higher gravitational pull to the earth, which allows a substance with lower density, and less gravitational pull, to float on top of it. As magma rises to the Earth's surface, it is being heated from below, which is what pushes it up instead of keeping it down in the Earth.

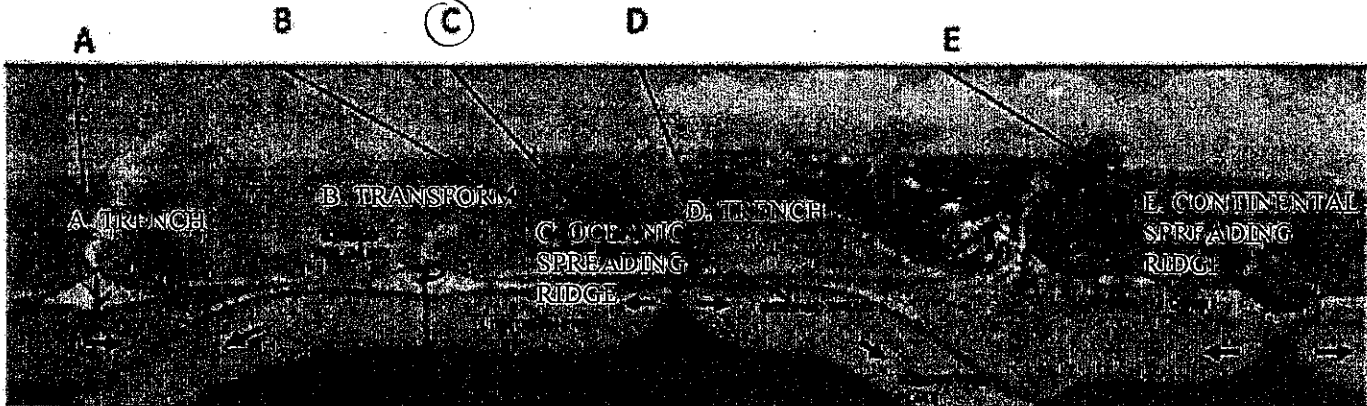
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

1. Japan had plants prepared for earthquakes, but not a magnitude 9.0
2. The water coming in ended up breaking down, releasing

STUDENT ID #: A41069790; GROUP #: J

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



B 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

B 3. Which of these carries the most material in streams?

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

A 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

Q4A: D

C 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

A 6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A410169790; GROUP #: J

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- C
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0

8. What type of energy drives slab pull?

- B
- a. Gravitational energy?
  - ☒ b. Thermal energy
  - c. Chemical energy

(the crust gets colder and becomes more dense pulling it down)

9. Which of the following is the most general correct explanation of buoyancy?

- D
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- B
- a. The movement of seismic waves through water?
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising
- b. Magma erupting and an airplane lifting off
- c. A hot balloon rising and an airplane lifting off

similarly, in a hot air balloon the hot air rises filling up the balloon and makes it rise because the hot air is less dense than the surrounding air.

B. Which of the following are most similar?

- C
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to A.: Both have to do with convection. The magma rises because it is warmer near the surface & the warmer the magma becomes the less dense it gets, which allows it to break through the surface of the Earth.

Please explain your response to B.: Both processes give off/release energy into the atmosphere.

STUDENT ID #: A41069790; GROUP #: J

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Haitian earthquake was much deadlier than the Japanese earthquake for many different reasons. Even though the Japanese earthquake had a magnitude of 9.0 and the Haitian earthquake only had a magnitude of about a 7.0, Japan was more prepared socioeconomically and environmentally for it. For instance, Japan's buildings are built to withstand earthquakes and natural disasters. The buildings are on supports that are made to sway and shift with the forces of the earthquakes, which reduces pressure on the buildings. Japan has enough money to afford such protection against earthquakes. However, Haiti's buildings are made of concrete with little or no support present to protect against earthquakes. This is because their economy is not doing well enough to afford the right kind of protection against natural disasters. Therefore, during the earthquake in 2010, the buildings collapsed, which killed thousands of people. Also, Japan has had more earthquakes in the past so they are more prepared for them.

STUDENT ID #: A41069790; GROUP #: J

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy is when two materials of different density interact. If a material is less dense than the surrounding material then the less dense material will rise or even float. However, if a material is more dense than the surrounding material, then the more dense material will sink. When an oceanic plate subducts under a continental plate, the ocean water causes a change in the composition of the asthenosphere, causing it to melt forming magma. The hotter this magma gets the less dense it also gets causing it to rise. The magma is becoming hotter and more of a liquid so it also becomes more buoyant and will rise through the lithosphere. However, if the magma begins to cool it will become less buoyant and will stop rising and it will harden adding to the width of the crust.

continental.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

- 1) building (plant) wasn't strong enough
- 2) too much radiation

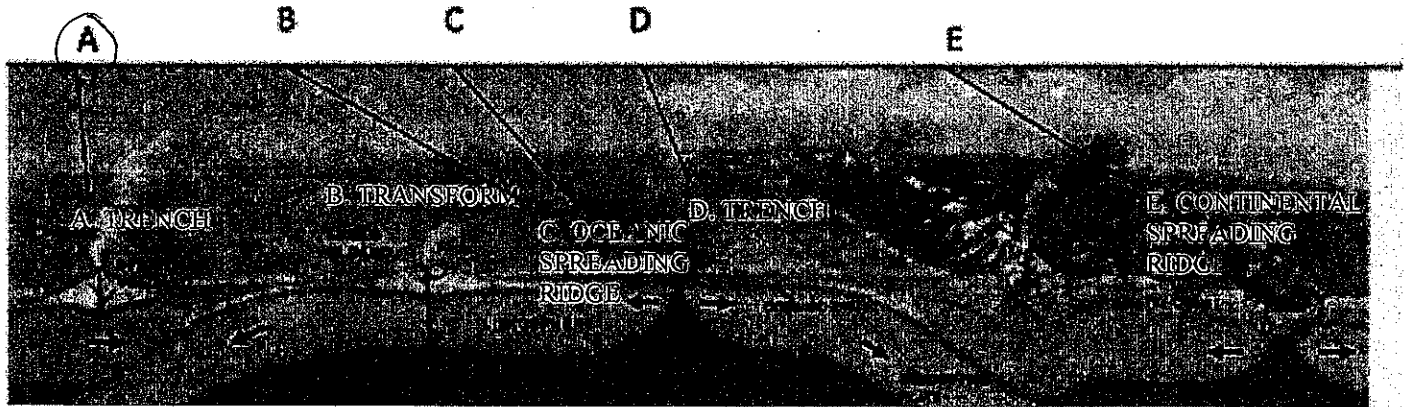


A 42254860 EXAM #2; Sibley/Libarkin, Spring 2011; 100 points

STUDENT ID #: ~~Kenneth J. Sibley~~; GROUP #: J

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

Q.4A. D

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_ : GROUP # \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - ☒ b. 8.0
  - c. 9.0
  - d. 10.0
8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
Both magma and hot air are less dense than their surroundings, so they rise up as the more dense material pushes them up from beneath them.

- B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:  
Both respiration and burning coal are the breakdown of organic matter that release carbon dioxide back into the atmosphere, respiration uses organisms to break down the materials, while burning coal doesn't.

STUDENT ID #: A42254860; GROUP #: 5

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

Both the Japan earthquake and Haitian earthquake were very deadly and caused lots of damage. The damage done to Haiti and the death toll were much higher than Japan though. Japan had the economic resources to be able to fund research and protection to earthquakes and tsunamis. The Japanese had seismographs, which are used to detect tsunamis, to help alert them about the potential danger impending. Even though the alerts still do not give much time to help protect people, it gave the Japanese a little extra time to at least partially evacuate coastlines. With Haiti, no warning was able to be given, so the waves were not met with any preparedness. Also, the Japanese structures and buildings close to the ocean were built to withstand earthquakes, or at least some preparedness measure or precaution was taken near the coastline. Haiti was hit with an earthquake of slightly less magnitude than Japan, yet its structures were not built to uphold any kind of disasters like this. Therefore, when the earthquake hit, much more damage was done, which many people were killed by falling buildings and structures, making the death toll in Haiti rise faster than in Japan. Without the money to properly be able to prepare for earthquakes and tsunamis, it makes sense why Haiti would face higher death tolls.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy is the relative density of one substance to another. ~~The~~ The less dense material will rise in relation to the more dense material, making it float.

Magma, when it has been first formed, is very hot and less dense than the surrounding continental rock.

~~As it rises~~ The magma begins to rise because it is less dense, but as it rises through the colder continental rock, it also cools, making it become more dense. As the magma becomes more dense through the continental rock, it slows its ascent, but will continue to rise since it is still less dense than the rock. If the magma cools enough <sup>(so it is the same density as continental rock)</sup>, it will crystallize and become part of the continental rock, ~~some~~ making it thicker. The magma's ascent is slowed as it cools because it uses its heat to be able to maneuver through the solid rock more easily.

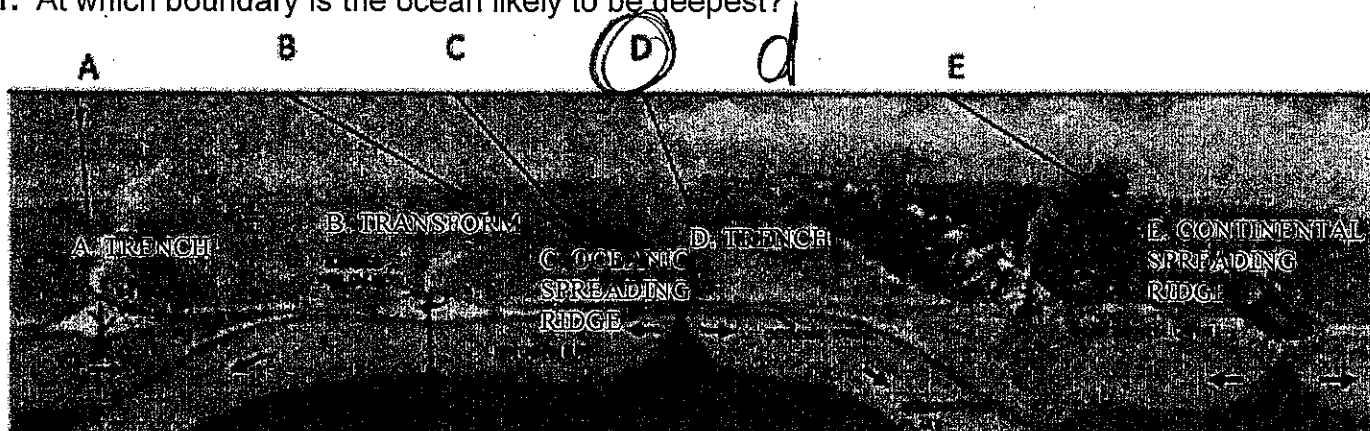
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

It was flooded with water  
and the fans broke so the systems  
couldn't be cooled.

STUDENT ID #: A40461394; GROUP #: K

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- C c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- b. Suspended load
- C c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- A a. A = compaction, B = oxidation, C = photosynthesis  
b. A = burial, B = respiration, C = weathering  
c. A = burial, B = oxidation, C = photosynthesis  
d. A = compaction, B = degassing, C = photosynthesis

4a) Answer  $\Rightarrow$  E

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- B b. Ocean-ocean divergent boundary
- c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- A a. Continental rocks are less dense than oceanic rocks.  
b. Oceanic rocks are less dense than continental rocks.  
c. Continental rocks are warmer than oceanic rocks.  
d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: K

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

a. 7.0

b. 8.0

c. 9.0

d. 10.0

A 8. What type of energy drives slab pull?

a. Gravitational energy

b. Thermal energy

c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

A a. Buoyancy will occur when two materials of differing temperature interact.

b. Buoyancy will occur when two materials of differing structure interact.

c. Buoyancy will occur when two materials of differing phase interact.

d. Buoyancy will occur when two materials of differing density interact.

e. Buoyancy will occur when two materials of differing composition interact.

C 10. Which of the following can cause a tsunami?

a. The movement of seismic waves through water

b. The undersea displacement of water

c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

A a. Magma erupting and a hot air balloon rising

b. Magma erupting and an airplane lifting off

c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

They both rise because of buoyancy - the process in which the ~~heat~~ heat acts as pressure to raise up the balloon/magma - sinking the cold in a circle.

B. Which of the following are most similar?

C a. Photosynthesis and respiration

b. Photosynthesis and burning coal

c. Respiration and burning coal

Please explain your response to B.:

They are both a system of taking in Oxygen and producing CO<sub>2</sub>.

STUDENT ID #: A40461394; GROUP #: K

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Haitian earthquake I believe was a 7.0, from what I remember from class, and the Japanese was a 9.0 - the Japanese was also much closer to the surface level on the lithosphere however, as we saw in the video Japan had built its buildings to withstand earthquakes by installing springs <sup>at</sup> the base of the steel frame so they would sway in the wind where Haiti built out of concrete because of money (they are less well off) and to protect from hurricanes. Since concrete does not sway it collapsed and killed many people, also the Japanese benefited from the new cell phone warning system that gave them 8 minutes to get away/safe.

STUDENT ID #: \_\_\_\_\_; GROUP #: 12

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy is the process by which heat pushes up the molecules and melts them to magma forcing them to rise, the hotter they get - the faster they move - the closer they get to the earth's surface the more they cool.

as the cold magma pushes the hot up it replaces it, cooling it and turning it to rock.



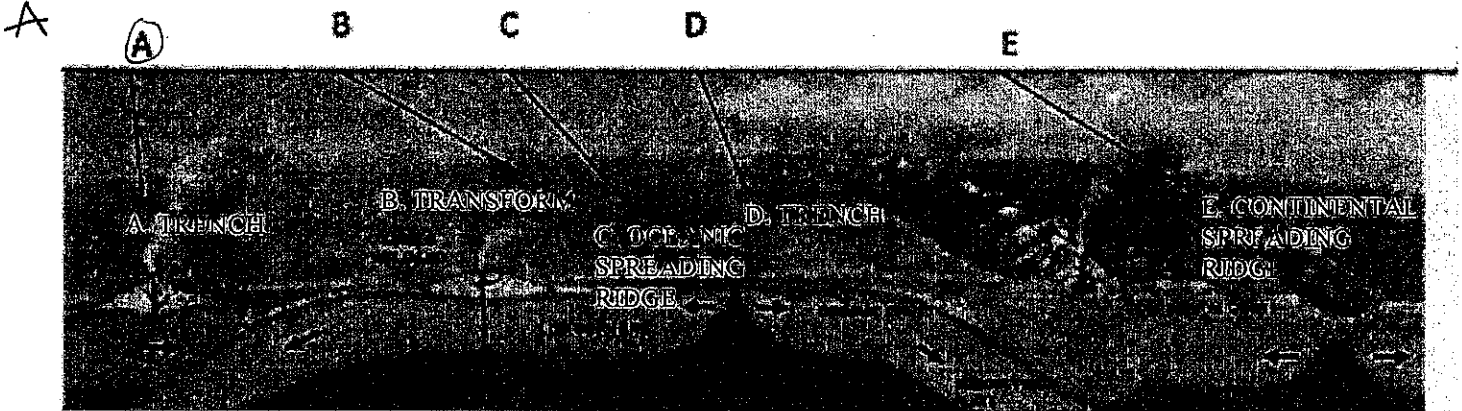
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake? It was only built to withstand an earthquake of average magnitude - for money reasons; it should have been built to withstand a 9.5 - the biggest possible earthquake - like they build them in America. Money and no foresight.



STUDENT ID #: A42627086; GROUP #: K

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



? 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- B
- a. Continental crust does not melt very well at convergent boundaries.
  - b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- B
- a. Dissolved load
  - b. Suspended load
  - c. Bed load

extra credit  
4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- 4A
- D
- a. A = compaction, B = oxidation, C = photosynthesis
  - b. A = burial, B = respiration, C = weathering
  - c. A = burial, B = oxidation, C = photosynthesis
  - d. A = compaction, B = degassing, C = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- A
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- B
- a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- ☐ a. 7.0  
☐ b. 8.0  
☒ c. 9.0  
☐ d. 10.0

8. What type of energy drives slab pull?

- ☒ a. Gravitational energy  
☐ b. Thermal energy  
☐ c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- ☐ a. Buoyancy will occur when two materials of differing temperature interact.  
☐ b. Buoyancy will occur when two materials of differing structure interact.  
☒ c. Buoyancy will occur when two materials of differing phase interact.  
☐ d. Buoyancy will occur when two materials of differing density interact.  
☐ e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- ☐ a. The movement of seismic waves through water  
☒ b. The undersea displacement of water  
☐ c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising  
☐ b. Magma erupting and an airplane lifting off  
☐ c. A hot balloon rising and an airplane lifting off

Please explain your response to A:  
The magma rock is hot & as it is "pushed up" through pressure it is causing it to rise & w/ a hot air balloon as the hot air rises into the balloon from the pressure or the heat it rises into the atmosphere

B. Which of the following are most similar?

- ☒ a. Photosynthesis and respiration  
☐ b. Photosynthesis and burning coal  
☐ c. Respiration and burning coal

Please explain your response to B:  
Photosynthesis involves the sun & heat during photosynthesis things are changed like carbohydrates or chemicals in the plant. When coal is burned there is a change in chemicals causing energy to be released.   
a. more energy released

STUDENT ID #: A42627086; GROUP #: \_\_\_\_\_

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Haitian Earthquake was much more deadlier than the Japanese earthquake for a few reasons. 1) The socioeconomic status of Haiti is much lower than Japan & since they don't have as much \$ they don't have the right resources to build strong buildings to withstand an earthquake, where Japan has the \$ and resources to build buildings w/ the support needed to withstand an earthquake. The environmental factors also contributed to the death tolls because in Japan there are a lot of buildings that have the support & a lot of farms where not as many people might live but in Haiti there's a lot more people living in areas where a lot of damage could happen?

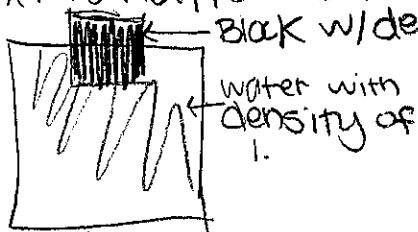
The magnitude of the Japan earthquake was 8.9 but the Haiti one was around a 7. I believe & because of where the earthquake happened played a role in the damage

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

A) explanation of buoyancy



Since the blocks density is half of the density of the water half of it will be above water. & if the block was double the density of the water it would sink to the bottom

B) Buoyancy changes as magma rises because as the magma heats up more its becoming less dense but everything around it is staying the same.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

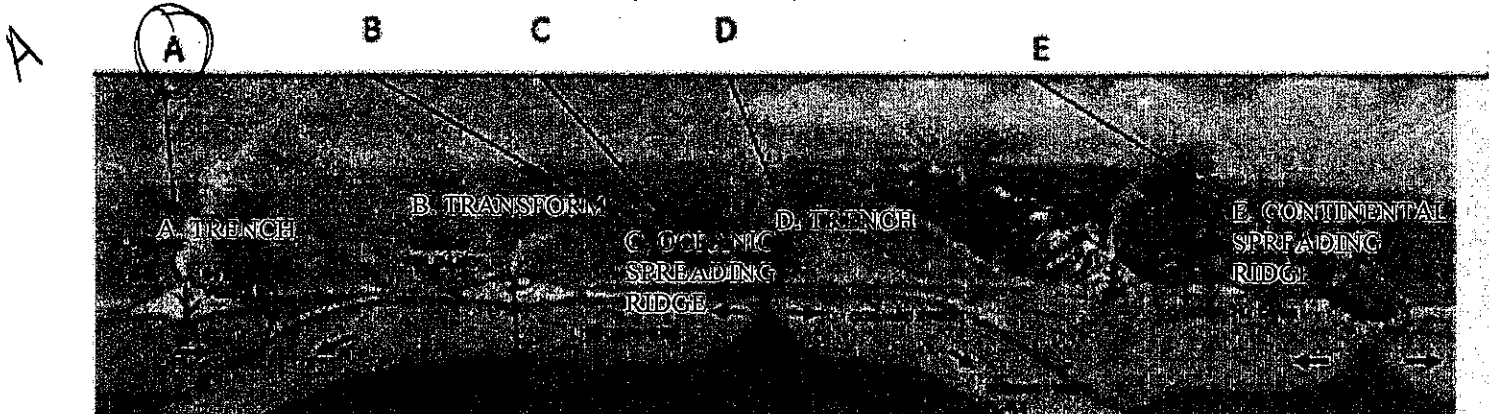
ISP 203A: GLOBAL CHANGE  
EXAM #2; Sibley/Libarkin, Spring 2011; 100 points

I

STUDENT ID #: A43082453; GROUP #: K

MULTIPLE CHOICE (20 points each) (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- B
- a. Continental crust does not melt very well at convergent boundaries.
  - ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- C
- ☒ a. Dissolved load
  - b. Suspended load
  - ☒ c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- A
- ☒ a. A = compaction, B = oxidation, C = photosynthesis
  - b. A = burial, B = respiration, C = weathering
  - c. A = burial, B = oxidation, c = photosynthesis
  - d. A = compaction, B = degassing, c = photosynthesis

4A.

D

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- C
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- A
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A43682453; GROUP #: 12

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- ☒ a. 7.0  
☐ b. 8.0  
☐ c. 9.0  
☐ d. 10.0

8. What type of energy drives slab pull?

- ☒ a. Gravitational energy  
☐ b. Thermal energy  
☐ c. Chemical energy

Cold plates are pulled toward Earth's center

9. Which of the following is the most general correct explanation of buoyancy?

- ☐ a. Buoyancy will occur when two materials of differing temperature interact.  
☐ b. Buoyancy will occur when two materials of differing structure interact.  
☒ c. Buoyancy will occur when two materials of differing phase interact.  
☐ d. Buoyancy will occur when two materials of differing density interact.  
☐ e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- ☐ a. The movement of seismic waves through water  
☒ b. The undersea displacement of water  
☐ c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising  
☐ b. Magma erupting and an airplane lifting off  
☐ c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

As magma erupts the gas is being squeezed out of it causing it to erupt. Like when a hot air balloon fills with causing it to rise

B. Which of the following are most similar?

- ☒ a. Photosynthesis and respiration  
☐ b. Photosynthesis and burning coal  
☐ c. Respiration and burning coal

Please explain your response to B.:

Both release calcium

STUDENT ID #: A43082453; GROUP #: K

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The magnitude of the earthquake in Japan was around 7, one of the worst earthquakes on record. Haiti earthquake was severe now every with a magnitude around 5. The earthquake however was much deadlier in Haiti due to their economic conditions. Haiti is full of poor home, unstable buildings, and weren't as prepared for the earthquake. Haiti is also a smaller "island" than Japan is. When the after math of tsunami hit both Haiti & Japan, Haiti had no rescue force like Japan did, which caused many more deaths.

STUDENT ID #: A436082453; GROUP #: K

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy is when a less dense object floats, while the denser object sinks. Temperature plays a huge role in the density of an object. The buoyancy of magma changes as it rises because it becomes cooler. However as the magma cools it warms the lithosphere making it easy for the magma to rise to earth's surface.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

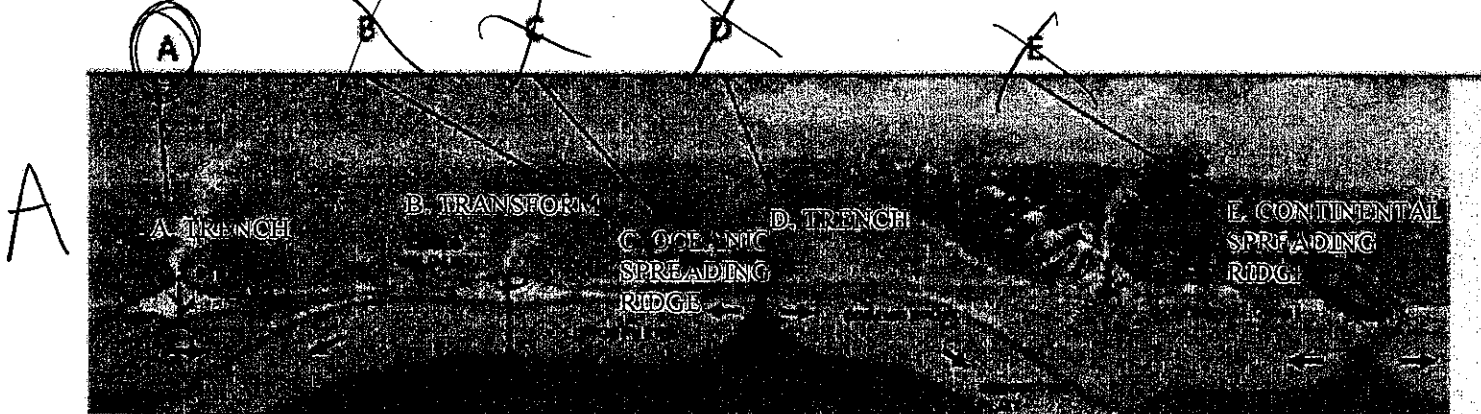
Its magnitude was so big, There was an aftermath of the tsunami.



STUDENT ID #: A43330797; GROUP #: K

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- ~~a. Continental crust does not melt very well at convergent boundaries.~~  
b. Continental crust is so thick that melt cools before it reaches the surface. B  
~~c. Continental crust overlies mantle that is too cold for much melting to occur.~~

3. Which of these carries the most material in streams?

- a. Dissolved load  
b. Suspended load B  
c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis A  
~~b. A = burial, B = respiration, C = weathering~~  
~~c. A = burial, B = oxidation, C = photosynthesis~~  
d. A = compaction, B = degassing, C = photosynthesis
- 4A A

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- ~~a. Ocean-continent transform boundary~~  
~~b. Ocean-ocean divergent boundary~~  
c. Continent-ocean convergent boundary C

6. Why do continents never subduct under oceans?

- a. Continental rocks are less dense than oceanic rocks. A  
b. Oceanic rocks are less dense than continental rocks.  
~~c. Continental rocks are warmer than oceanic rocks.~~  
~~d. Oceanic rocks are warmer than continental rocks.~~

Oceans are more dense

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- a. 7.0
- b. 8.0
- ☒ c. 9.0
- d. 10.0

C

8. What type of energy drives slab pull?

- ☒ a. Gravitational energy
- b. Thermal energy
- c. Chemical energy

A

9. Which of the following is the most general correct explanation of buoyancy?

- a. Buoyancy will occur when two materials of differing temperature interact.
- b. Buoyancy will occur when two materials of differing structure interact.
- c. Buoyancy will occur when two materials of differing phase interact.
- ☒ d. Buoyancy will occur when two materials of differing density interact.
- e. Buoyancy will occur when two materials of differing composition interact.

D

10. Which of the following can cause a tsunami?

- a. The movement of seismic waves through water
- ☒ b. The undersea displacement of water
- c. The heating of water during an earthquake

B

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising
- b. Magma erupting and an airplane lifting off
- c. A hot balloon rising and an airplane lifting off

A

Please explain your response to A.:

magma erupts bc it is less dense than the surrounding + a balloon bc it is less dense than the air

B. Which of the following are most similar?

- ~~a. Photosynthesis and respiration~~
- ☒ b. Photosynthesis and burning coal
- c. Respiration and burning coal

B

Please explain your response to B.:

they both convert organic material to CO<sub>2</sub>

STUDENT ID #: A43330792; GROUP #: K

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

a. The Japanese earthquake's magnitude was a 9.0 while the Haitian was between 7. The Japanese earthquake was much deeper than the Haitian earthquake + Japan's earthquake had more vibrations that were deeper + caused it to have a 4 magnitude.

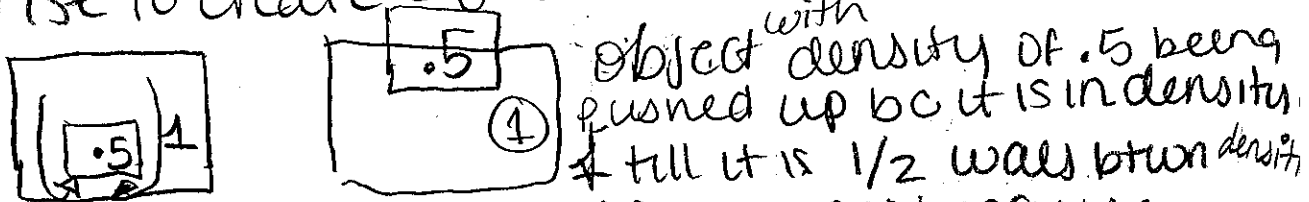
b.) Japan was much more prepared for an earthquake than Haiti. Haiti had infrastructure made out of cement, which was not able to protect people + it caused many deaths, while Japan had much stricter bldg codes. In addition Japan is more richer while Haiti has tons of poverty so they don't have \$ to invest in infrastructure funding. In addition "Japan" had \$ to invest in a warning system which saved lives while Haiti did not bc they were not economically well off. These caused the Haiti earthquake to have a much higher death toll than Japan.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

a. Buoyancy when movement occurs because of differing densities. When something is less dense + surrounded in something that is more dense it will rise to create equilibrium.



b. Buoyancy changes as magma rises because initially the magma is really hot + has a low density. As it rises it may cool and as it cools its density will  $\uparrow$ . Ultimately, the magma could crystallize in the rock with a rock that is = density to it, or if it is hot enough it could rise all the way up + erupt.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

- 1) It was built cheaply
- 2) It did not have a containment area

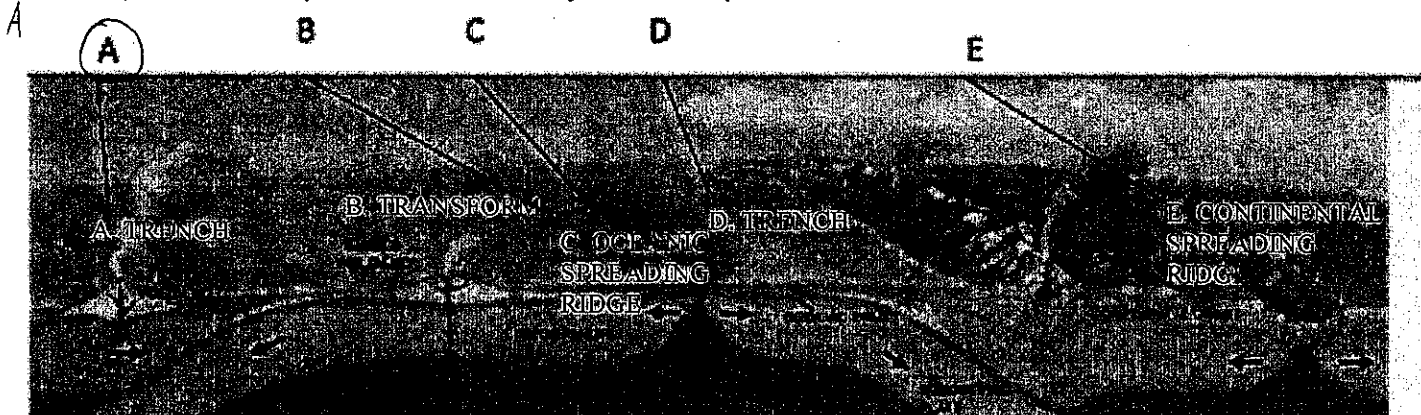
ISP 203A: GLOBAL CHANGE  
EXAM #2; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A41439593; GROUP #: L

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- b a. Continental crust does not melt very well at convergent boundaries.  
☒ b. Continental crust is so thick that melt cools before it reaches the surface.  
c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- b a. Dissolved load  
☒ b. Suspended load  
c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis  
b. A = burial, B = respiration, C = weathering  
c. A = burial, B = oxidation, C = photosynthesis  
☒ d. A = compaction, B = degassing, C = photosynthesis

4A  
D.

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- c a. Ocean-continent transform boundary  
b. Ocean-ocean divergent boundary  
☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- a ☒ a. Continental rocks are less dense than oceanic rocks.  
b. Oceanic rocks are less dense than continental rocks.  
c. Continental rocks are warmer than oceanic rocks.  
d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?  
C. a. 7.0  
b. 8.0  
c. 9.0  
d. 10.0
8. What type of energy drives slab pull?  
A. a. Gravitational energy  
b. Thermal energy  
c. Chemical energy
9. Which of the following is the most general correct explanation of buoyancy?  
d. a. Buoyancy will occur when two materials of differing temperature interact.  
b. Buoyancy will occur when two materials of differing structure interact.  
c. Buoyancy will occur when two materials of differing phase interact.  
d. Buoyancy will occur when two materials of differing density interact.  
e. Buoyancy will occur when two materials of differing composition interact.
10. Which of the following can cause a tsunami?  
b. a. The movement of seismic waves through water  
b. The undersea displacement of water  
c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?  
a. a. Magma erupting and a hot air balloon rising  
b. Magma erupting and an airplane lifting off  
c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

Hot air in a balloon is less dense than surrounding cold air. Similarly, magma is less dense than surrounding rock. Due to heat, they are more buoyant and they rise.

- B. Which of the following are most similar?  
b. a. Photosynthesis and respiration  
b. Photosynthesis and burning coal  
c. Respiration and burning coal

Please explain your response to B.:

Both photosynthesis and burning coal create chemical energy

STUDENT ID #: YA41439593; GROUP #: C

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The earthquake in Haiti was deadlier in part because the quake occurred nearer to the surface. Because of this, more water was displaced even though the magnitude of the quakes were relatively similar.

More importantly, the Haitian earthquake was more devastating because of the poor infrastructure of Haiti. Japan had the resources and the technology for a much safer society in the face of an earthquake, including steel buildings and spring support structures. Haiti could afford less steel, and had many buildings of less stable concrete. Thus, the destruction was greater.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy is the relation between materials of a different density. More buoyant material rises in relation to less buoyant material. For example, a flotation device is more buoyant than water, so it floats on the surface of a lake. Magma, because of its heat, is more buoyant than solid rock. It rises from the earth. However, as it rises, it cools. As magma begins to cool and solidify, it becomes denser like the surrounding rock and it loses some of its buoyant force.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

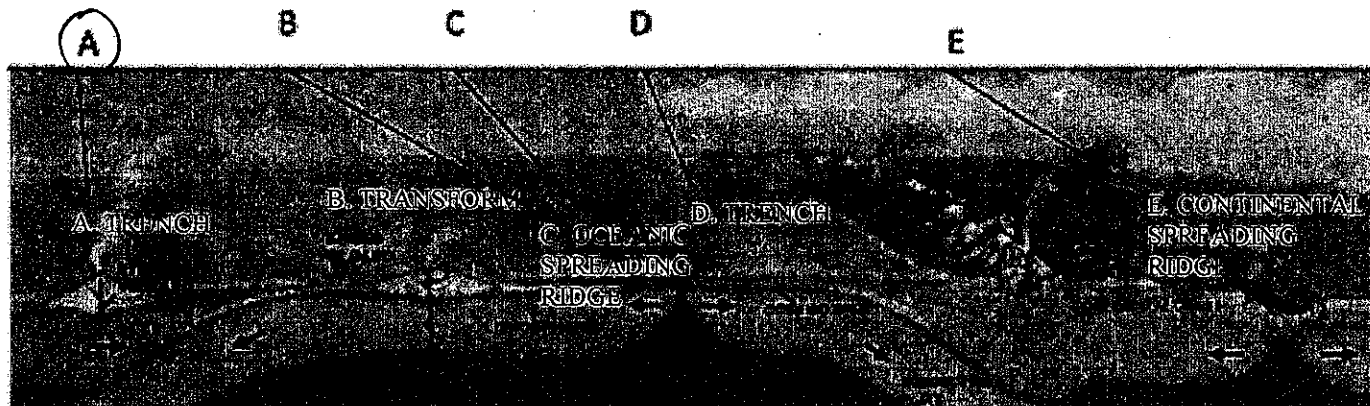
The tsunami knocked out power to the plants. Power was needed to pump water into cooling towers. The water sank and plutonium was exposed. Additionally, the plants were built to minimal safety regulations for financial reasons. An earthquake of such a



STUDENT ID #: A42065731; GROUP #: L

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- ☒ 1. At which boundary is the ocean likely to be deepest?



- ☒ 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?
- Continental crust does not melt very well at convergent boundaries.
  - ☒ Continental crust is so thick that melt cools before it reaches the surface.
  - Continental crust overlies mantle that is too cold for much melting to occur.

- ☒ 3. Which of these carries the most material in streams?
- Dissolved load
  - ☒ Suspended load
  - Bed load

- ☒ 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ A = compaction, B = oxidation, C = photosynthesis
- A = burial, B = respiration, C = weathering
- ~~A = burial, B = oxidation, C = photosynthesis~~
- A = compaction, B = degassing, C = photosynthesis

4a.) D

- ☒ 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- ☒ Ocean-continent transform boundary
- Ocean-ocean divergent boundary
- Continent-ocean convergent boundary

- ☒ 6. Why do continents never subduct under oceans?

- ☒ Continental rocks are less dense than oceanic rocks.
- Oceanic rocks are less dense than continental rocks.
- Continental rocks are warmer than oceanic rocks.
- Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- B
- a. 7.0
  - ☒ b. 8.0
  - c. 9.0
  - d. 10.0

A 8. What type of energy drives slab pull?

- ☒ a. Gravitational energy
- b. Thermal energy
- c. Chemical energy

D 9. Which of the following is the most general correct explanation of buoyancy?

- a. Buoyancy will occur when two materials of differing temperature interact.
- b. Buoyancy will occur when two materials of differing structure interact.
- c. Buoyancy will occur when two materials of differing phase interact.
- ☒ d. Buoyancy will occur when two materials of differing density interact.
- e. Buoyancy will occur when two materials of differing composition interact.

B 10. Which of the following can cause a tsunami?

- a. The movement of seismic waves through water
- ☒ b. The undersea displacement of water
- c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising
- b. Magma erupting and an airplane lifting off
- c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

The heating of <sup>gas</sup> particles causes both the magma + air in the balloon to rise or erupt. Pressure exerted on each also provide to the reaction.

B. Which of the following are most similar?

- a. Photosynthesis and respiration
- b. Photosynthesis and burning coal
- ☒ c. Respiration and burning coal

Please explain your response to B:

Both respiration and coal involve the release of gas particles into the air to achieve energy.

STUDENT ID #: A42065731; GROUP #: 6

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

Although both extremely devastating, the Haitian earthquake was a much deadlier disaster than the Japanese earthquake. The approximate magnitude of the Japanese earthquake was 8, whereas the Haitian earthquake measured to slightly over 5 in magnitude. Even if the Haitian earthquake had a lower magnitude, the country of Haiti is much less developed than Japan and have many more people inhabited by the ocean. The under-development of the country could not stand such disaster and the country also had a much more difficult time providing relief effort to help the Haitians than the Japanese did. Japan is a much stronger country in terms of economic and developed value than Haiti is, so even though the earthquake may not have been as severe, such factors resulted in a higher death toll for the Haiti population.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

As magma rises towards the surface, gas particles are released (degassing) which causes a change of density for the magma. The magma then becomes less dense and the pressure that is forcing the magma up from the asthenosphere is able to move the magma, causing an eruption. Buoyancy occurs when two materials of different densities interact, like the gas particles in the magma and the particles that are forcing the magma upwards from underneath the earth's surface's differing densities.

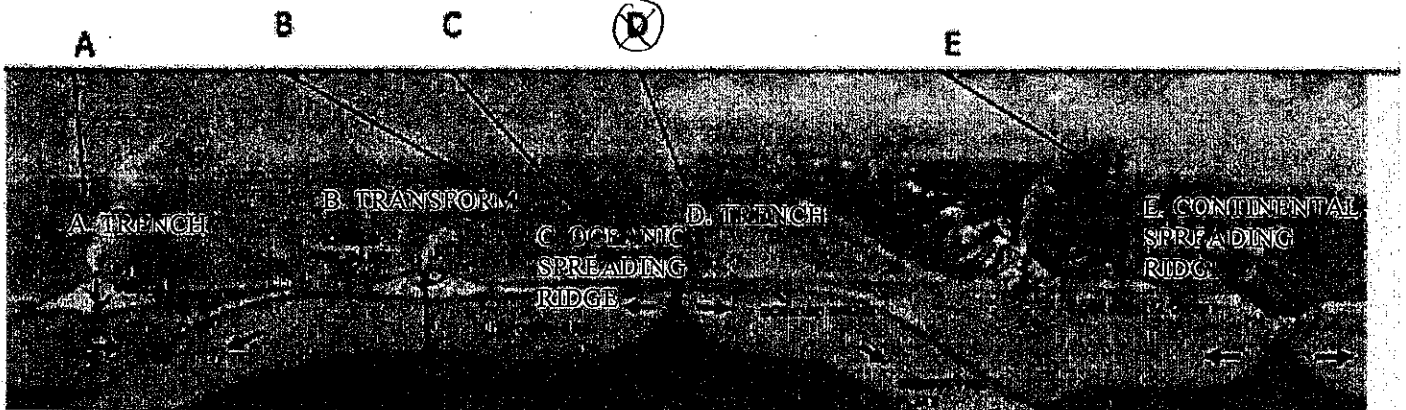
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

- 1) The earthquakes were unexpected able to reach the plant
- 2) There was too much nuclear power in the given domain circulating to be able to withstand the quake's magnitude

STUDENT ID #: A43499348; GROUP #: L

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- B
- a. Continental crust does not melt very well at convergent boundaries.
  - ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- B
- a. Dissolved load
  - ☒ b. Suspended load
  - c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- A
- ☒ a. A = compaction, B = oxidation, C = photosynthesis
  - b. A = burial, B = respiration, C = weathering
  - c. A = burial, B = oxidation, C = photosynthesis
  - d. A = compaction, B = degassing, C = photosynthesis

4A D

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- C
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- A
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A43499348; GROUP #: L

C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- a. 7.0
- b. 8.0
- ☒ c. 9.0
- d. 10.0

B 8. What type of energy drives slab pull?

- a. Gravitational energy
- ☒ b. Thermal energy
- c. Chemical energy

D 9. Which of the following is the most general correct explanation of buoyancy?

- a. Buoyancy will occur when two materials of differing temperature interact.
- b. Buoyancy will occur when two materials of differing structure interact.
- c. Buoyancy will occur when two materials of differing phase interact.
- ☒ d. Buoyancy will occur when two materials of differing density interact.
- e. Buoyancy will occur when two materials of differing composition interact.

X 10. Which of the following can cause a tsunami?

- ☒ a. The movement of seismic waves through water
- b. The undersea displacement of water
- c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A 11. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising
- b. Magma erupting and an airplane lifting off
- c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

They are both less dense than their surrounding material and hotter as well so as they are surrounded by cooler material they both get pushed up by it

C 12. Which of the following are most similar?

- a. Photosynthesis and respiration
- b. Photosynthesis and burning coal
- ☒ c. Respiration and burning coal

Please explain your response to B.:

both let off gases as they occur

STUDENT ID #: A43499348; GROUP #: L

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

Even though the Japan earthquake had a greater magnitude of 9.0 than the Haitian earthquake which was between seven and eight the Haitian earthquake's death toll was much greater than Japan's. There are several reasons for this occurrence. Firstly Japan is much better off socioeconomically than Haiti this means that their infrastructures were better suited for a disaster to occur as well as there was more immediate rescue operations occurring in the aftermath. Second Japan and Haiti have different environmental factors that contributed to the different numbers in deaths. Japan experienced more tsunamis than Haiti and the epicenter was more centrally located in the Haitian earthquake in a more populated area. All of these factors led Japan to have less of a death toll than Haiti from their earthquakes.

STUDENT ID #: A43499348; GROUP #: L

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

As hot magma is pushed up from the colder material being pushed down it begins to cool as well as it makes its way to the surface. This cooling of the magma causes it to become less buoyant because it loses the heat it had from Earth's core. This sometimes results in magma never reaching the surface because as it cools it becomes just as buoyant as its surrounding material.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

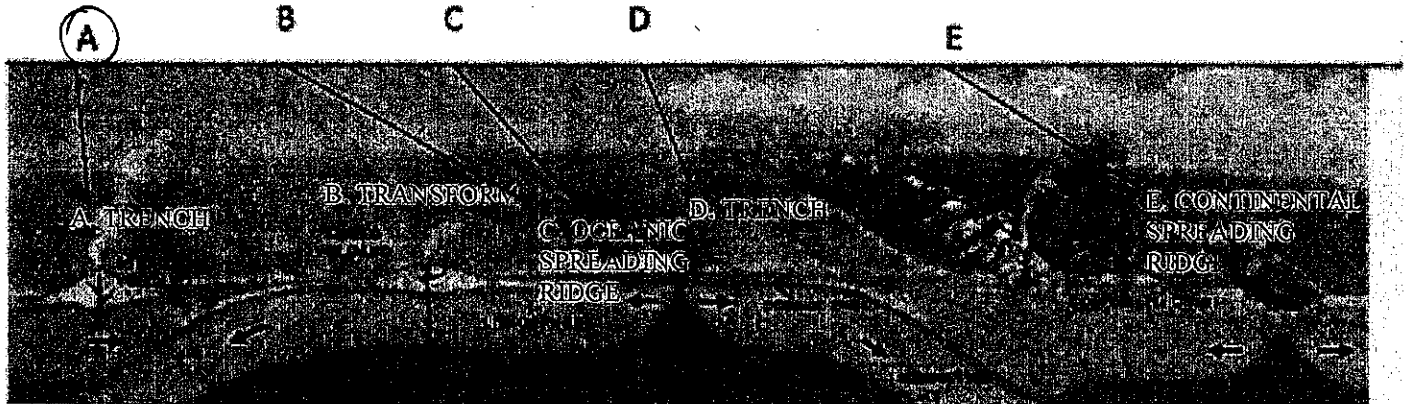
- never seen an earthquake with such a high magnitude of 9.0.
- weren't prepared for the whole island to shift.



STUDENT ID #: A42204525; GROUP #: L

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- ☒ c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- ~~c. A = burial, B = oxidation, C = photosynthesis~~
- d. A = compaction, B = degassing, C = photosynthesis

4a. ☒ A

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- ☒ d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - ☒ b. 8.0
  - c. 9.0
  - d. 10.0
8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - d. Buoyancy will occur when two materials of differing density interact.
  - ☒ e. Buoyancy will occur when two materials of differing composition interact.
10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
For magma to erupt it must be heated to rise. The same with a hot air balloon because the air must be heated to raise it.

- B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - ☒ b. Photosynthesis and burning coal
  - c. Respiration and burning coal

Please explain your response to B.:  
Burning coal and photosynthesis both use CO<sub>2</sub> to complete their processes.

STUDENT ID #: V A42204525; GROUP #: L

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

a. The earthquake in Japan was an approximate magnitude level 8 compared to Haiti's approximate level 10, causing Haiti's earthquake to be more deadly and damaging.

Japan's socioeconomic lifestyle is higher than Haiti's. Japan has less poverty and disease stricken individuals compared to Haiti. More people could flee the area because they had the means and money to do so. Buildings and earthquake/hurricane preparedness were more well-known in Japan's educated environment versus Haiti's.

The tsunami hitting Japan was less deadly because the magnitude of the earthquake was slightly lower and their socioeconomic standard of living was better.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy is the difference in density / composition of a given material / substance. The more dense an object is the less buoyant it will be.

The buoyant force changes when magma rises because the magma changes composition. Magma is heated so it melts from a solid to a liquid. Once this change in state occurs the magma continues to heat up causing it to rise towards the earth's surface. Temperature, composition, and pressure all play a role in the rising of magma.

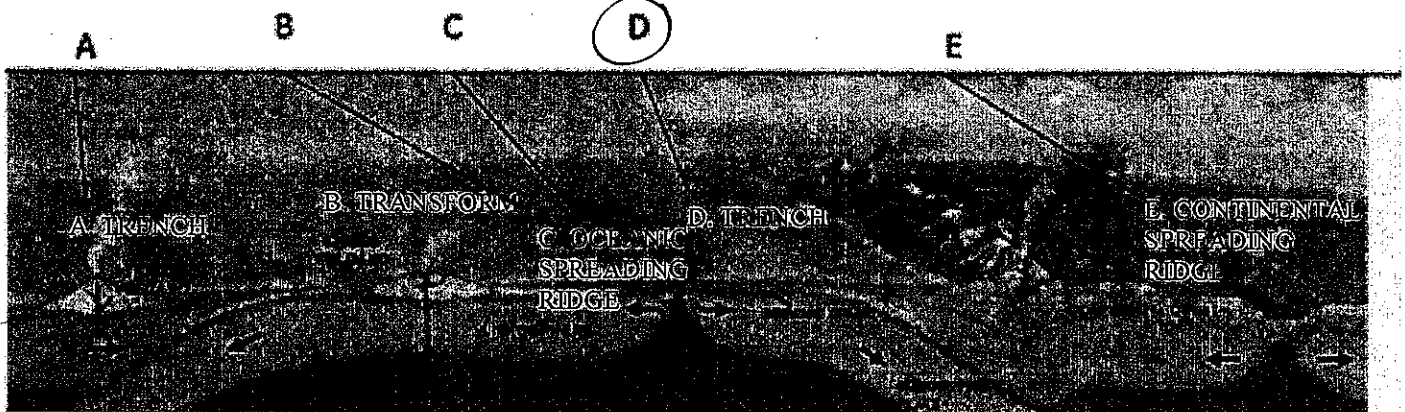
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

- ① building procedures
- ② location / force of tsunami

STUDENT ID #: A34305310; GROUP #: M

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- D 1. At which boundary is the ocean likely to be deepest?



- B 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?
- a. Continental crust does not melt very well at convergent boundaries.
  - ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

- B 3. Which of these carries the most material in streams?
- a. Dissolved load
  - ☒ b. Suspended load
  - c. Bed load

- A 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

4a D

- C 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - ☒ c. Continent-ocean convergent boundary

- A 6. Why do continents never subduct under oceans?
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

- C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
- A 8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
- D 9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
- B 10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
magma is warmer than surrounding rock, causing it to be less dense and rise. Air in a hot air balloon is warmer than surrounding air, causing it to be less dense and rise.

- B B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - ☒ b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:  
both involve the release of CO<sub>2</sub>

STUDENT ID #: A34305310; GROUP #: M

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Japan earthquake was around an 8.9, where the Haitian earthquake was around a 6, however, the Japan earthquake was less deadly. This is in part due to the preparations each country took to prepare for such events. Because Japan lies on an ocean-ocean convergent boundary, the earthquakes are at a much greater scale. However, because it is an island the shock was able to dissipate to some of the surrounding water. Japan also was more prepared environmentally and structurally than Haiti. Since Haiti lies within a continent (compared to an island) and is right on the coast, it took the bulk of the earthquake shock/tsunami, making it a more deadly earthquake than the larger magnitude Japan earthquake.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy is a force that is equal to the amount of fluid an object in that fluid displaces. As the magma is warmed, it becomes less dense than the surrounding rock, and in turn becomes more buoyant. It is also filled with gas bubbles that contribute to its less dense/more buoyant nature. As the magma rises, the gas bubbles are "released" out of solution and the magma erupts through the more dense rock. As the gas bubbles leave and the magma begins to cool, the magma becomes more dense and starts to harden. When the magma becomes more dense than it was previously, it, in turn, will be less buoyant. When it reaches a point where it is more dense than the surrounding environment it will sink. Buoyancy changes in conjunction with changing density. If an object/liquid is less dense than a surrounding environment, it is able to "float" on that environment more easily, making it more buoyant. The opposite is true for a more dense object/liquid.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

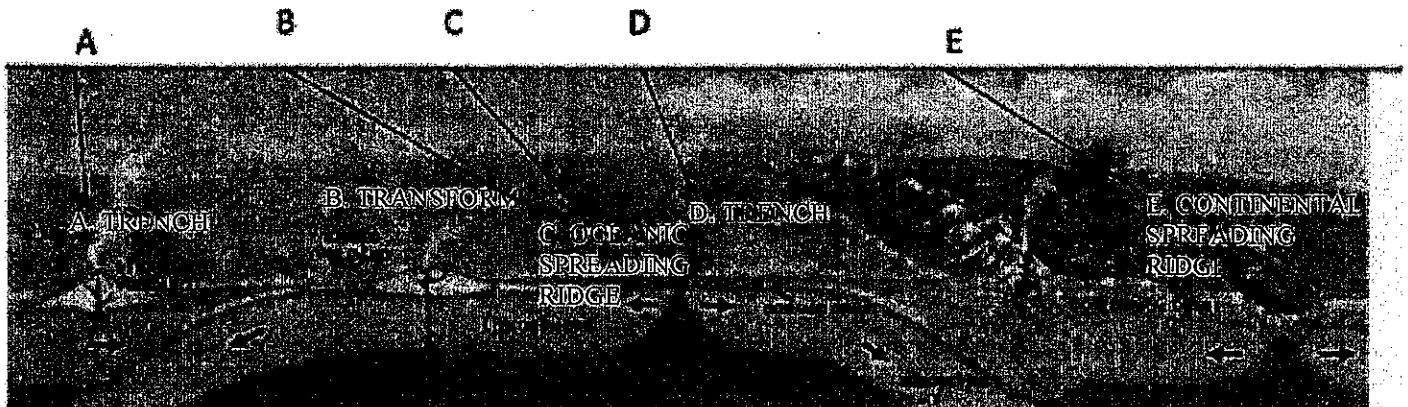
- it wasn't designed ~~to handle~~ to handle an earthquake at that large of a scale (only designed for a 6-7 magnitude I think)
- type of material it was constructed from



STUDENT ID #: A43915317; GROUP #: M

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- A ?
- ☒ a. Continental crust does not melt very well at convergent boundaries.
  - b. Continental crust is so thick that melt cools before it reaches the surface.
  - ☒ c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- C
- a. Dissolved load
  - b. Suspended load
  - ☒ c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- A
- ☒ a. A = compaction, B = oxidation, C = photosynthesis
  - b. A = burial, B = respiration, C = weathering
  - c. A = burial, B = oxidation, C = photosynthesis
  - d. A = compaction, B = degassing, C = photosynthesis
- 1A: B

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- C
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- A
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- C
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0

8. What type of energy drives slab pull?

- A
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- D
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- B
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water as a result of a sudden fault in the earth's crust
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- A
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

Magma erupts because it has a lower density than the surrounding rock. And a hot air balloon rises as a result of the air inside the balloon being heated up and less dense than the surrounding air.

B. Which of the following are most similar?

- a. Photosynthesis and respiration
- b. Photosynthesis and burning coal
- ☒ c. Respiration and burning coal

Please explain your response to B.:

Both respiration and coal produce heat and Carbon dioxide as a by product

STUDENT ID #: ✓A43915317; GROUP #: M

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

A. The earthquake in Japan was of greater magnitude than the earthquake in Haiti because it produced a higher marking on the Richter scale.

B. The overall death toll was greater in Haiti than in Japan because the people of Japan were better prepared for a rather large earthquake because earthquakes occur more frequently due to Japan's geological position.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- a. An explanation of buoyancy.
- b. Description of why buoyancy changes as a magma rises.

a. Buoyancy occurs when two substances or materials are in close proximity and have a difference in density resulting in one having more buoyancy than the other (less dense) (more dense)

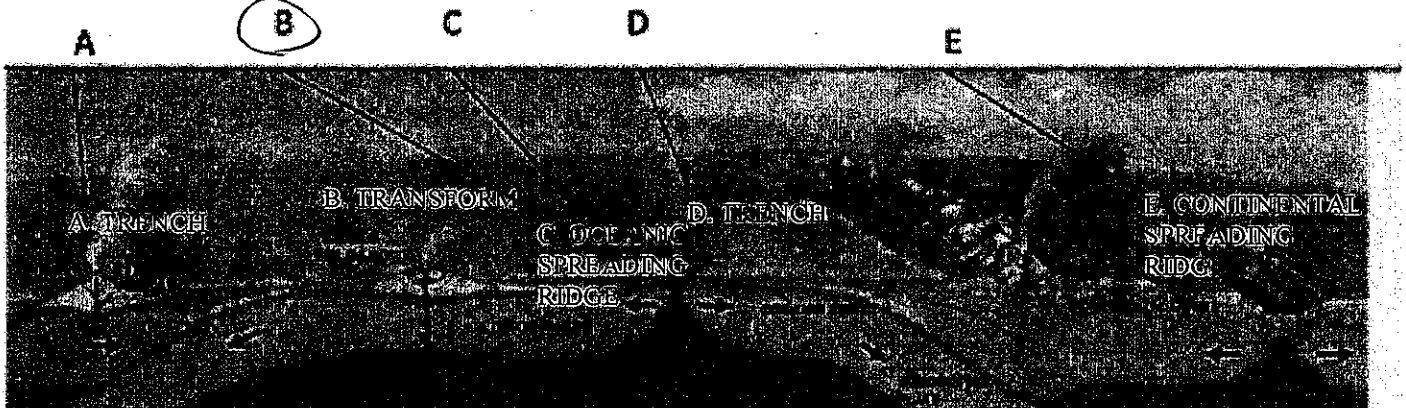
b. The buoyancy of magma changes as it approaches the Earth's surface because the magma begins to cool down and as the magma cools down it becomes more dense, this leads to the difference in densities to be less significant and the magma becomes less buoyant as well.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

STUDENT ID #: A42773599; GROUP #: M

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

B 1. At which boundary is the ocean likely to be deepest?



A 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

B 3. Which of these carries the most material in streams?

- a. Dissolved load
- b. Suspended load
- c. Bed load

4A | D

A 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

Aren't oxidation and degassing same? since it would be going to CO<sub>2</sub> which any time there is an increase in C-O bond it is also oxidation!

C 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- c. Continent-ocean convergent boundary

A 6. Why do continents never subduct under oceans?

- a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

ISP 203A: GLOBAL CHANGE  
EXAM #2; Sibley/Libarkin, Spring 2011; 100 points

2

STUDENT ID #: A12773599; GROUP #: M

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- a. 7.0
- b. 8.0
- ☒ c. 9.0
- d. 10.0

8. What type of energy drives slab pull?

- ☒ a. Gravitational energy
- b. Thermal energy
- c. Chemical energy

*Both Really (A+B) since it happens because one is cooler than the other which changes densities, but is still pulled down because of gravity*

9. Which of the following is the most general correct explanation of buoyancy?

- a. Buoyancy will occur when two materials of differing temperature interact.
- b. Buoyancy will occur when two materials of differing structure interact.
- c. Buoyancy will occur when two materials of differing phase interact.
- ☒ d. Buoyancy will occur when two materials of differing density interact.
- e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- a. The movement of seismic waves through water
- ☒ b. The undersea displacement of water
- c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising
- b. Magma erupting and an airplane lifting off
- c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

*They both rise due to the fact that they are heated until their densities are lower than the surrounding materials*

B. Which of the following are most similar?

- a. Photosynthesis and respiration
- b. Photosynthesis and burning coal
- ☒ c. Respiration and burning coal

Please explain your response to B.:

*First two don't make sense because photosynthesis creates greater larger molecules*

*so Photosynthesis is opposite of respiration/burning coal. Both take larger molecules and make smaller ones.*

STUDENT ID #: 412773599; GROUP #: M

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The earthquake in Haiti was a 7ish I Believe? not completely sure, but the Japan earthquake was a 9.0<sup>21</sup>. The reasons why it was much more deadly in Haiti than in Japan is because of their building materials. Japan is the 3rd largest economic power in the world and can afford to buy steel ~~and~~ and other materials that Haiti cannot, with this steel they can build buildings that are better equipped to deal with earthquakes ~~being~~ (using spring underground and ~~steel~~) "earthquake proofing techniques". Haiti is a poor country and cannot afford steel, and because they live in hurricane hall they need something that can withstand the hurricanes, ~~that as~~ while being cheap and affordable, they use concrete instead and have no earthquake proofing techniques. So when a ~~the~~ earthquake hits in Haiti, it is devastating because the buildings cannot withstand it, and many die.

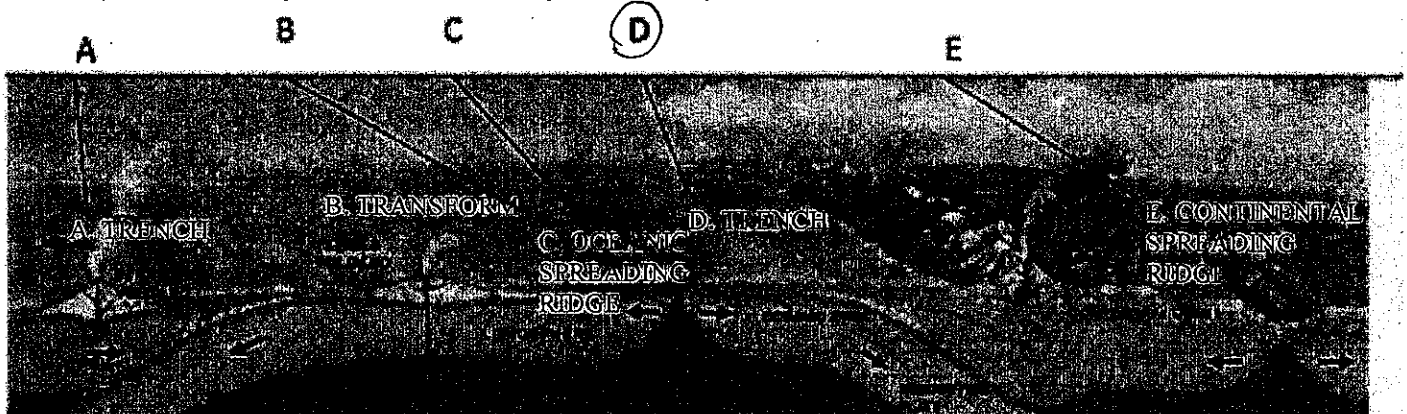
they did not have enough coolant,  
and it was not designed to handle an ~~emergency~~ <sup>earthquake</sup>



STUDENT ID #: A42383475; GROUP #: M

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.  
B ☒ b. Continental crust is so thick that melt cools before it reaches the surface.  
c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load  
B ☒ b. Suspended load  
c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- A ☒ a. A = compaction, B = oxidation, C = photosynthesis  
b. A = burial, B = respiration, C = weathering  
c. A = burial, B = oxidation, C = photosynthesis  
d. A = compaction, B = degassing, C = photosynthesis

4a. ☒ D

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary  
C ☒ b. Ocean-ocean divergent boundary  
c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- A ☒ a. Continental rocks are less dense than oceanic rocks.  
b. Oceanic rocks are less dense than continental rocks.  
c. Continental rocks are warmer than oceanic rocks.  
d. Oceanic rocks are warmer than continental rocks.

This could really be two answers

Ocean rocks are both cooler & more dense

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- C
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0

8. What type of energy drives slab pull?

- A
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- D
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- B
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising
- b. Magma erupting and an airplane lifting off
- c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

Magma erupts when Hot gas starts bubbling and floats upwards just like how a hot air balloon flies

C

B. Which of the following are most similar?

- a. Photosynthesis and respiration
- b. Photosynthesis and burning coal
- ☒ c. Respiration and burning coal

Please explain your response to B.:

Both produce CO<sub>2</sub> as a result of the reaction

STUDENT ID #: A42383975; GROUP #: M

**SHORT ANSWER. 25 points each (50 points total)**

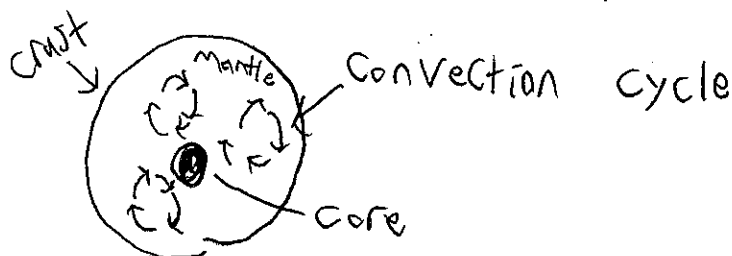
1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Magnitude of The Japanese earthquake was a higher <sup>(9.0)</sup> magnitude than the Haitian <sup>(7.0)</sup> earthquake but the Japanese buildings are designed to withstand large earthquakes by being re-enforced with steel (an expensive process). The Haitian buildings are made out of concrete to withstand hurricane winds but crumble and collapse under the effects of earthquakes. The Haitian Earthquake was much deadlier because Haiti is a poor nation that can't afford to earthquake proof their like the more wealthy Japanese nation can which is why the devastation was so much more

STUDENT ID #: A42383975; GROUP #: M

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy is the density of material in comparison to the (fluid) material around it in which the more dense material sinks to the bottom and the lighter material floats on top in relation to gravitational pull. Magma gets super heated in the earth's core which causes the magma to become less dense and begin floating upwards through the more dense magma. As the magma floats further away from the core it begins to cool and starts to become less dense and will begin to sink again below newly heated and hotter magma. This process is called convection and works in a cycle beneath the earth. (This force also drives plate tectonics)



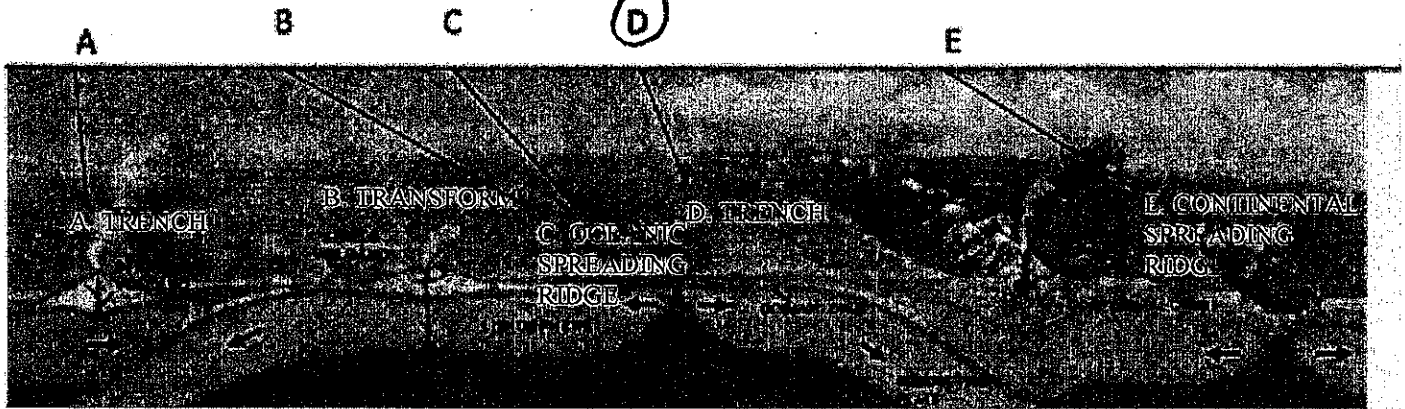
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

Were only built to withstand earthquakes to a certain magnitude. Its coolant leaked out of its chambers and caused it to super heat when it was damaged.

STUDENT ID #: A42833012; GROUP #: N

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- B
- a. Continental crust does not melt very well at convergent boundaries.
  - ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- B
- a. Dissolved load
  - ☒ b. Suspended load
  - c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- A
- ☒ a. A = compaction, B = oxidation, C = photosynthesis
  - ~~b. A = burial, B = respiration, C = weathering~~
  - ~~c. A = burial, B = oxidation, C = photosynthesis~~
  - ~~d. A = compaction, B = degassing, C = photosynthesis~~

Question 4a: C

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- C
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- A
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: 42833012; GROUP #: N

C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- a. 7.0
- b. 8.0
- ☒ c. 9.0
- d. 10.0

8. What type of energy drives slab pull?

- A
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy

D 9. Which of the following is the most general correct explanation of buoyancy?

- a. Buoyancy will occur when two materials of differing temperature interact.
- b. Buoyancy will occur when two materials of differing structure interact.
- c. Buoyancy will occur when two materials of differing phase interact.
- ☒ d. Buoyancy will occur when two materials of differing density interact.
- e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- A
- ☒ a. The movement of seismic waves through water
  - b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising
- b. Magma erupting and an airplane lifting off
- c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

Magma erupts because it is less dense than its surrounding. Hot air balloons rise because the hot air is more dense than the cooler air.

B. Which of the following are most similar?

- ☒ a. Photosynthesis and respiration
- b. Photosynthesis and burning coal
- c. Respiration and burning coal

Please explain your response to B.:

Photosynthesis & respiration both are essentially to an organism living & receiving energy. Humans need respiration. Plants need photosynthesis.

STUDENT ID #: 42833012; GROUP #: N

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Japan earthquake & the Haitian earthquake caused catastrophic damage. The Japan earthquake (9 magnitude) & Haitian earthquake (7 magnitude) both caused tsunamis to occur. The Haitian earthquake was so much deadlier though because the epicenter was right in the middle of a large city that wasn't prepared for earthquakes of that magnitude. Japan has building buildings that are structurally more resistant to earthquakes for a while now. Japan & Haiti are much different countries. Haiti is a developing country which doesn't have money/resources to plan better for earthquakes/tsunamis unlike Japan which is a developed well run country.

STUDENT ID #: 42833012; GROUP #: N

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy is the force that drives something upward because of density differences. Magma is far less dense so it begins to rise but then cools as it moves through material which is also less dense.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

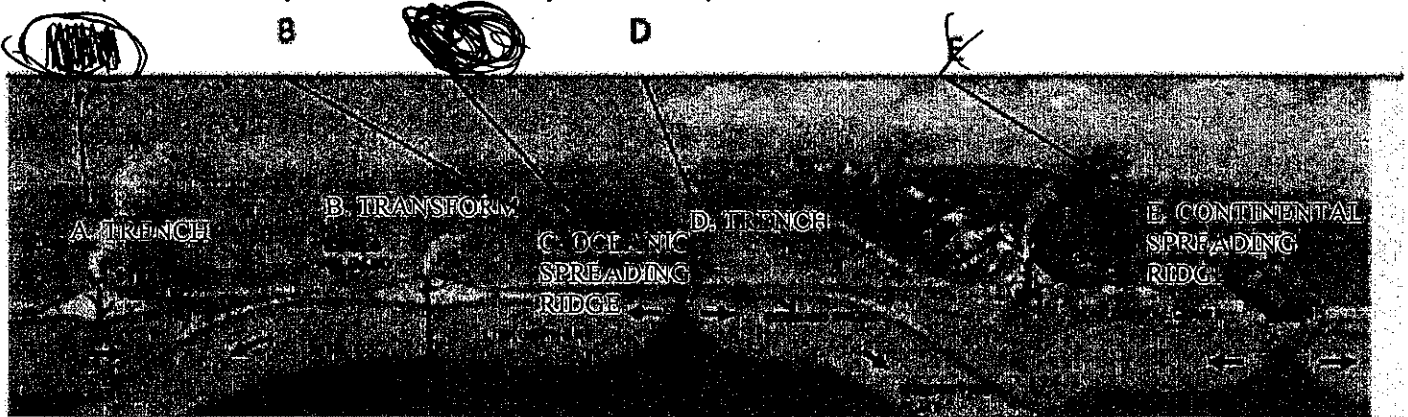
The plants are too close together  
+ the cooling systems failed.



STUDENT ID #: AU3637189; GROUP #: N

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- ☒ a. Continental crust does not melt very well at convergent boundaries.  
b. Continental crust is so thick that melt cools before it reaches the surface.  
c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- ☒ a. Dissolved load  
☒ b. Suspended load  
c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis  
~~b. A = burial, B = respiration, C = weathering~~  
~~c. A = burial, B = oxidation, C = photosynthesis~~  
d. A = compaction, B = degassing, C = photosynthesis

4A. D

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- ☒ a. Ocean-continent transform boundary  
b. Ocean-ocean divergent boundary  
☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.  
~~b. Oceanic rocks are less dense than continental rocks.~~  
c. Continental rocks are warmer than oceanic rocks.  
d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- ☒ a. 7.0  
☐ b. 8.0  
☒ c. 9.0  
☐ d. 10.0

8. What type of energy drives slab pull?

- ☒ a. Gravitational energy  
☐ b. Thermal energy  
☐ c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- ☐ a. Buoyancy will occur when two materials of differing temperature interact.  
☐ b. Buoyancy will occur when two materials of differing structure interact.  
☐ c. Buoyancy will occur when two materials of differing phase interact.  
☒ d. Buoyancy will occur when two materials of differing density interact.  
☐ e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- ☐ a. The movement of seismic waves through water  
☒ b. The undersea displacement of water  
☐ c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising  
☐ b. Magma erupting and an airplane lifting off  
☒ c. A hot balloon rising and an airplane lifting off

Please explain your response to A.: They are similar because both include heating and as a result rising through more dense material

B. Which of the following are most similar?

- ☒ a. Photosynthesis and respiration  
☐ b. Photosynthesis and burning coal  
☐ c. Respiration and burning coal

Please explain your response to B.: both are naturally occurring processes that take one gas & produce another.

STUDENT ID #: V43637189; GROUP #: 11

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

Japan is a much more strong economy than Haiti, therefore ~~allowing~~ allowing it to be more prepared for such a natural disaster, and spare more resources for disaster relief. This allowed Japan to prevent more deaths even though the magnitudes of the earthquakes themselves were similar. Also the Haiti earthquake ~~occurred~~ occurred more directly on Haitian land, while much of the Japan Earthquake occurred in the ocean. Haiti is smaller than Japan which ~~makes the earthquake particularly~~ makes the earthquake particularly deadly because it happened in such a relatively small amount of land.

Japan = 9.0  
Haiti = 7.0 a  
little  
bit  
lower

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

buoyancy is the process of a less dense material being surrounded by a more dense material and being pushed upward.

This occurs with magma because it is less dense than the surrounding rock, especially after filling with gas bubbles and becoming even less dense than it was before.

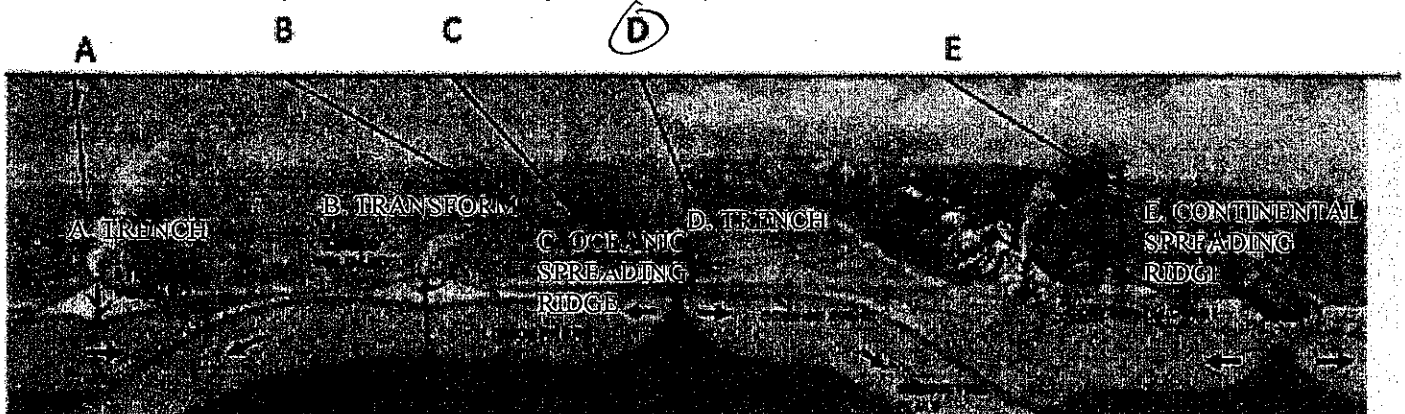
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

The power plants infrastructure was too weak to withstand the strong earthquake.  
Also soon after the earthquake, a tsunami followed further

STUDENT ID #: A41107889; GROUP #: N

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- B
- a. Continental crust does not melt very well at convergent boundaries.
  - ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- B
- a. Dissolved load
  - ☒ b. Suspended load
  - c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- A
- ☒ a. A = compaction, B = oxidation, C = photosynthesis
  - b. A = burial, B = respiration, C = weathering
  - c. A = burial, B = oxidation, C = photosynthesis
  - d. A = compaction, B = degassing, C = photosynthesis

4A D

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- B
- a. Ocean-continent transform boundary
  - ☒ b. Ocean-ocean divergent boundary
  - c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- b
- a. Continental rocks are less dense than oceanic rocks.
  - ☒ b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A41107889; GROUP #: N

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- ☐ a. 7.0  
☐ b. 8.0  
☒ c. 9.0  
☐ d. 10.0

8. What type of energy drives slab pull?

- ☒ a. Gravitational energy  
☐ b. Thermal energy  
☐ c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- ☐ a. Buoyancy will occur when two materials of differing temperature interact.  
☐ b. Buoyancy will occur when two materials of differing structure interact.  
☐ c. Buoyancy will occur when two materials of differing phase interact.  
☒ d. Buoyancy will occur when two materials of differing density interact.  
☐ e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- ☐ a. The movement of seismic waves through water  
☒ b. The undersea displacement of water  
☐ c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising  
☐ b. Magma erupting and an airplane lifting off  
☐ c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

As magma is heated it rises through the earth's crust much like when heat is added to a hot air balloon

B. Which of the following are most similar?

- ☐ a. Photosynthesis and respiration  
☐ b. Photosynthesis and burning coal  
☒ c. Respiration and burning coal

Please explain your response to B.:

In both of these oxygen is required and CO<sub>2</sub> and heat are bi products

STUDENT ID #: A41107889; GROUP #: N

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Japan 9.0 magnitude earthquake of 2011 had a much smaller death toll than the Haitian 7.0 earthquake of 2010 for a few main reasons. First, Japan has a warning system in place that gave an 8 minute alert to the residents of the nation. Second, the Japanese earthquake came off the coast of Japan whereas the Haitian one happened on the mainland. Lastly, Japan is a first world country with many precautions in place such as structuring their buildings to withstand these disasters, whereas Haiti is a 3rd world country with little money to take these precautionary measures.

STUDENT ID #: A41107889; GROUP #: N

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy is the product of the density of two or more materials, in which the less dense will rise. When magma is formed, water from a Subduction zone changes the composition of the atmosphere. This causes the atmosphere to melt and magma is formed. This magma is then less dense, because of the change in temperature, than the surrounding atmosphere, which causes it to rise. Once the magma rises, it will either release the gas bubbles and erupt, or it will cool and become more dense and sink back down.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

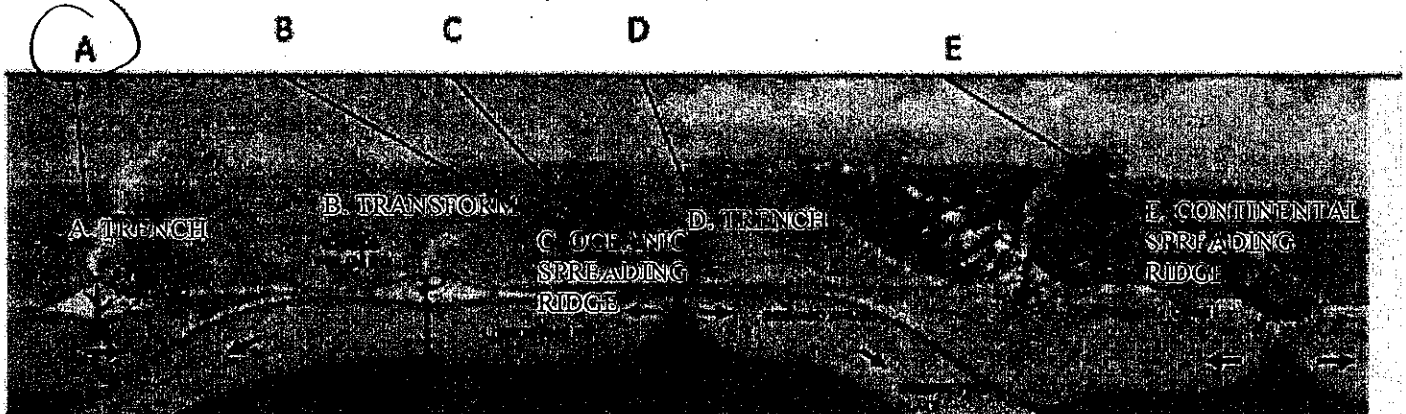
They built the power plant to withstand an earthquake with a magnitude of 7.0. Second, they tried to use seawater to cool it which only worsened the problem.



STUDENT ID #: A41262816; GROUP #: 0

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- ☒ c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- b. Suspended load
- ☒ c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, c = photosynthesis
- d. A = compaction, B = degassing, c = photosynthesis

4a) crystallization, uplift,  
transportation

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- ☒ a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A41262816; GROUP #: 0

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
9. Which of the following is the most general correct explanation of buoyancy?
- ☒ a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
10. Which of the following can cause a tsunami?
- ☒ a. The movement of seismic waves through water
  - b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- a. Magma erupting and a hot air balloon rising
  - ☒ b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
magma erupting and a airplane taking off are most similar because the most force from magma is when it erupts and the most force from a airplane is when it takes off. after the eruption and take off the flow generally become steady.

- B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:  
In respiration you are releasing some form of thermal heat and when coal is being burned you are releasing chemical heat, they are both similar because heat is being released.

STUDENT ID #: A41262816; GROUP #: 0

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

a) The Haitian earthquake was a 7 and The Japanese earthquake was a 9. The Japanese earthquake was not that bad because they had 8 minutes to fully prepare for the earthquake or to at least get to high ground. Because the plate boundary was very close to the surface it caused a wave, which lead to a tsunami. The Haitian earthquake occurred close to the earth as well but it was closer <sup>to the surface</sup> than the Japanese earthquake which caused significant damage to Haiti.

b) In Haiti, The buildings are made up of wood and cement. The buildings are not reinforced by steel which makes them sturdy. The reason the death toll in Haiti was higher (earthquake wise) is because the cement buildings broke and crushed the people inside. where as the buildings in Japan were earthquake ready with springs planted at the base of almost every building to withstand earthquakes. The steel was also added to maintain the building form. Haiti is a poor country and Japan had enough money and was ready because of the frequent earthquakes they get. The tsunami is what increased Japan's death toll.

STUDENT ID #: A41262816; GROUP #: 0

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

A.) Buoyancy is the process in which two materials interact at different temperatures. Buoyancy can be compared to density & the effect that things with a higher buoyancy and a higher density sink whereas a lighter buoyancy and density floats or rises.

B.) Buoyancy changes as magma rises because when the water bubbles form, they decrease the density of the magma and causes it to be pushed upward. As the magma is rising, it keeps increasing in temperature until it reaches the lithosphere, when the magma is able to find a fault to break through it erupts because of the water bubbles that have formed. The buoyancy changes because the density and temperature of the magma changes and when it finally reaches the earth's surface it starts to cool making the magma denser.

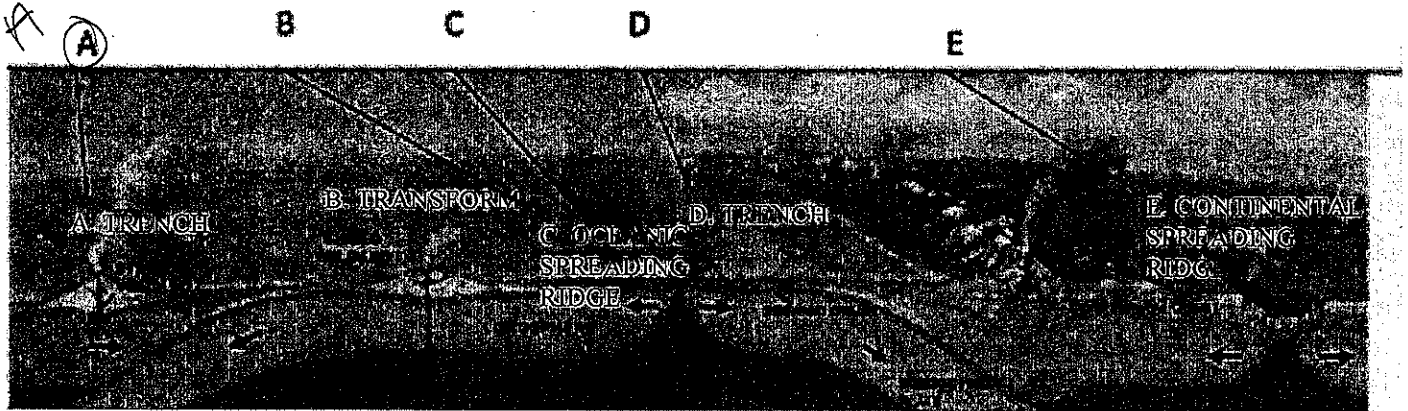
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

They were cheap in what they built the shield that was supposed to protect the area around the plant and the rods that were supposed to continuously stay under the water was exposed because of the water which caused the

STUDENT ID #: A42669593; GROUP #: N

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- ☐ a. Continental crust does not melt very well at convergent boundaries.  
☒ b. Continental crust is so thick that melt cools before it reaches the surface.  
☐ c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- ☒ a. Dissolved load  
☐ b. Suspended load  
☒ c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis  
☐ b. A = burial, B = respiration, C = weathering  
☒ c. A = burial, B = oxidation, C = photosynthesis  
☐ d. A = compaction, B = degassing, C = photosynthesis

4.a) D

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- ☒ a. Ocean-continent transform boundary  
☐ b. Ocean-ocean divergent boundary  
☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.  
☐ b. Oceanic rocks are less dense than continental rocks.  
☐ c. Continental rocks are warmer than oceanic rocks.  
☒ d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- ☒ a. 7.0  
☐ b. 8.0  
☐ c. 9.0  
☐ d. 10.0

8. What type of energy drives slab pull?

- ☐ a. Gravitational energy  
☒ b. Thermal energy  
☐ c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- ☐ a. Buoyancy will occur when two materials of differing temperature interact.  
☐ b. Buoyancy will occur when two materials of differing structure interact.  
☒ c. Buoyancy will occur when two materials of differing phase interact.  
☐ d. Buoyancy will occur when two materials of differing density interact.  
☐ e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- ☒ a. The movement of seismic waves through water  
☐ b. The undersea displacement of water  
☐ c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising  
☐ b. Magma erupting and an airplane lifting off  
☐ c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
Both the magma and hot air balloon rise when a high temperature is applied and they sink or lower as the temperature cools

B. Which of the following are most similar?

- ☒ a. Photosynthesis and respiration  
☐ b. Photosynthesis and burning coal  
☐ c. Respiration and burning coal

Please explain your response to B.:  
Both are an example of oxidation

STUDENT ID #: A42669593 ; GROUP #: \_\_\_\_\_

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

One of the reasons why the Japanese earthquake had less deaths than the Haitian earthquake was due to the difference in building structure codes. In Japan buildings must be built to withstand a certain magnitude of an earthquake, while Haiti didn't have such strict building structure code, so more buildings collapsed than in Japan causing more deaths. Japan was also better able to predict the magnitude, time and location of the earthquake ~~some~~ and better than Haiti which allowed them to take necessary precaution needs. Also Haiti was a magnitude 10 earthquake while Japan was a magnitude 9.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy will occur when 2 materials of different density interact. Magma rises because during subduction the tectonic plate contains rock which interacted with water during cooling, so the rock contained water molecules. Under pressure the water molecules are squeezed out. Under the right temperature and pressure the water creates magma when interacted with water. This magma then begins to erupt and rise to the surface due to the change in density. As it cools density is affected and stops rising.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

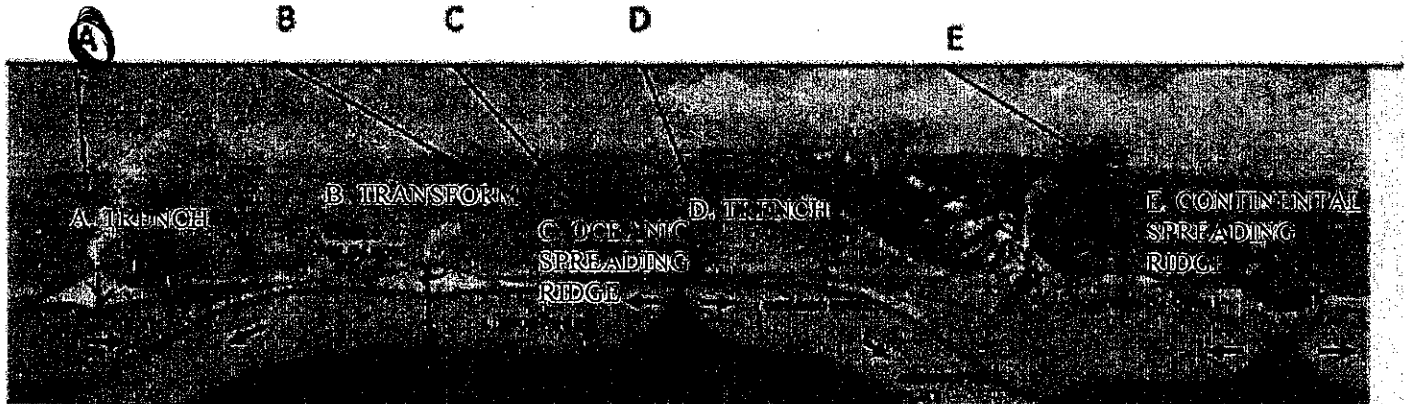


STUDENT ID #: A43643320; GROUP #: 0

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?

A



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

B

- a. Continental crust does not melt very well at convergent boundaries.
- ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

B

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

A

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

4a



5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

C

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

B

- a. Continental rocks are less dense than oceanic rocks.
- ☒ b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A43643320; GROUP #: 0

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- ☐ a. 7.0  
☐ b. 8.0  
☒ c. 9.0  
☐ d. 10.0

8. What type of energy drives slab pull?

- ☒ a. Gravitational energy  
☐ b. Thermal energy  
☐ c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- ☐ a. Buoyancy will occur when two materials of differing temperature interact.  
☐ b. Buoyancy will occur when two materials of differing structure interact.  
☐ c. Buoyancy will occur when two materials of differing phase interact.  
☒ d. Buoyancy will occur when two materials of differing density interact.  
☐ e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- ☐ a. The movement of seismic waves through water  
☒ b. The undersea displacement of water  
☐ c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising  
☐ b. Magma erupting and an airplane lifting off  
☐ c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

both involve heat of molecules  
causing the substance  
to rise toward the surface  
magma → surface of earth  
hot air → to surface of balloon

B. Which of the following are most similar?

- ☒ a. Photosynthesis and respiration  
☐ b. Photosynthesis and burning coal  
☐ c. Respiration and burning coal

Please explain your response to B.:

both release CO<sub>2</sub> &  
heat as products of  
the actions.

STUDENT ID #: A43643320 ; GROUP #: 0

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The earthquake that struck Japan had a magnitude of 8.9/9.0 & resulted in a death toll of around 10,000 or so people. The Earthquake in Haiti had a magnitude of 7.0 yet resulted in a death toll of over a 100,000. Despite Japan's earthquake being a great deal larger the devastation was not nearly as great as the devastation that took place a year before in Haiti. Japan is a country that is accustomed to having earthquakes (not 8.9 ones but still) & because of that it has been built to be able to handle the movement of the tectonic plates around it. This means that when the earthquake hit, Japan didn't lose as many buildings or systems because of the design of the architecture. Haiti however was poorly built & a nation of great poverty. The Haitian people don't have the resources to build homes or businesses that can withstand earthquakes so when the earthquake hit, it collapsed many buildings which resulted in a higher death toll.

STUDENT ID #: A43643320; GROUP #: 0

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy is the floating of a less dense object on top of a more dense object. Magma is buoyant because it is less dense than the surrounding lithosphere. However as the hot magma rises closer to the cool crust its heat starts to dissipate & it starts to cool. As magma cools it starts to gain more density, Magma will stop rising once it has an equal temperature to the material around it & it will no longer have a lower density.

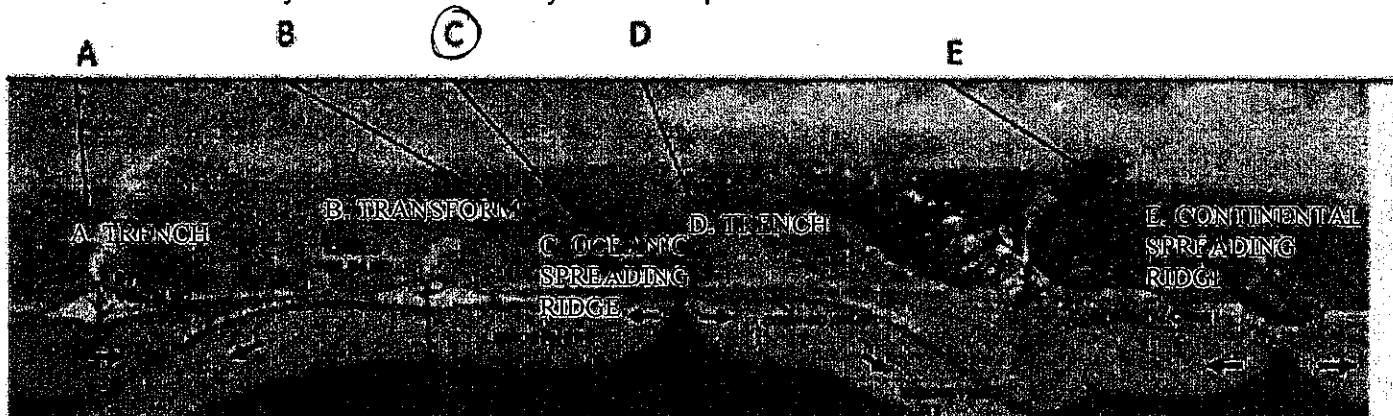
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

- built near the fault line that was nearest the epicenter
- shut off power which caused reactors to overheat b/c

STUDENT ID #: A34590917; GROUP #: 0

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of \_\_\_\_A\_\_\_\_, then becomes carbon in the atmosphere through the process of \_\_\_\_B\_\_\_\_, and then becomes carbon in plants through the process of \_\_\_\_C\_\_\_\_.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- ☒ c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

Question 4A. D

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- ☒ b. Ocean-ocean divergent boundary
- c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- ☒ c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A34590917; GROUP #: 0

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
Magma erupting and a hot air balloon rising are most similar because both are affiliated with warmer temperatures. Warmer things rise while cooler things sink. Less dense material rise because of gravity.

- B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:  
Respiration and burning coal because they both are driven by the same type of energy.

STUDENT ID #: A34590917; GROUP #: 0

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Haitian earthquake was much more deadlier than the Japanese earthquake because of a huge difference in the magnitude levels. The Haitian earthquake was a much higher magnitude than the Japanese earthquake, therefore resulting in stronger effects and deaths. Another result of a higher number of deaths were due to the fact that the Haitian buildings were made of concrete without any metal applied to them. This resulted in many buildings falling and more lives taken.

STUDENT ID #: A34590917; GROUP #: ①

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy causes materials to rise or fall due to and in relation to the density of materials. Buoyancy changes as magma rises because of the change in temperature, which results in the changing of density levels. Magma is very warm/hot and because of this it is less dense causing it to rise resulting in the change of buoyancy.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

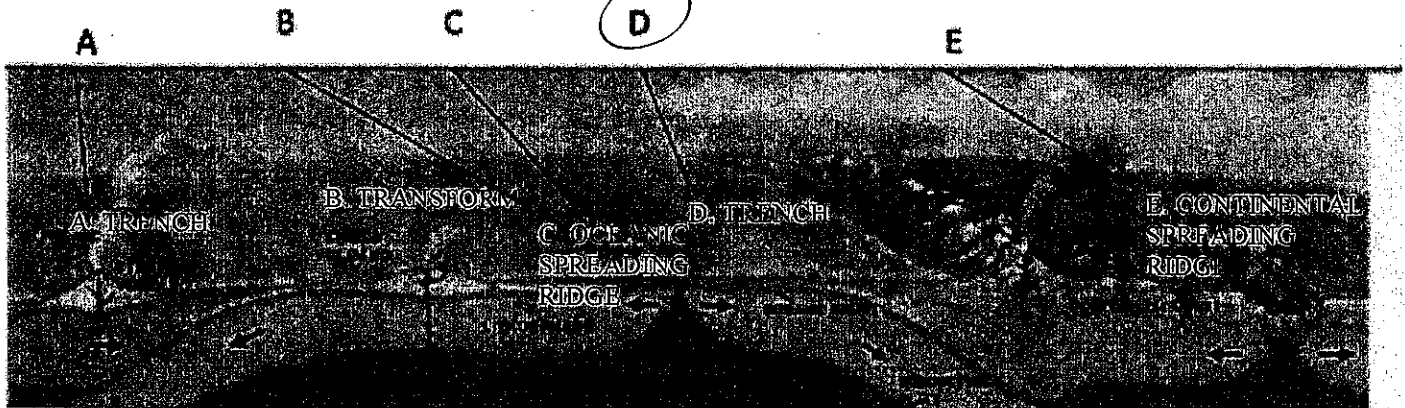
Because it was not built to withstand a greater number of natural hazards.



STUDENT ID #: A39800329; GROUP #: P

**MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.**

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- ☒ c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- ☒ a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- a. Continental rocks are less dense than oceanic rocks.
- ☒ b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A39800329; GROUP #: P

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- a. Magma erupting and a hot air balloon rising
  - ☒ b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
As magma degases and pressure increases, it will erupt.

- B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:  
Both involve oxidation.

STUDENT ID #: A39800329; GROUP #: P

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

An earthquake is the release of energy inside the earth. A tsunami is generated when faults drive through to the ocean floor. The ocean waves are displaced vertically and this displacement can generate a tsunami.

The Haitian earthquake was much deadlier than the Japanese earthquake for two reasons. First, the approximate magnitude of the Haitian earthquake was much stronger than the Japanese earthquake. Second, Haiti is a developing nation whereas Japan is a developed nation. This factor explains the relative difference in death tolls because Japan is more adequately prepared to respond to this sort of disaster than that of Haiti. In fact, the very fact that Japan organized a team of Japanese scholars to study the causes and solutions of the disaster is further evidence that Japan was better tasked to handle this sort of disaster.

Japan's was 9.0, Haiti's 10.0

STUDENT ID #: A39800329; GROUP #: P

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

As magma rises towards the Earth's surface, two important considerations arise, magma cooling and crust warming. As the magma cools, the density of the magma decreases, which increases its ascent. As the crust warms, the density increases, which also slows the ascent of magma. However, the fact that the crust warms impacts its deformation which means that ascent of magma will actually increase in speed or travel time. Buoyancy changes as magma rises because the molecules move faster which causes temperature to increase. As a result, density decreases.

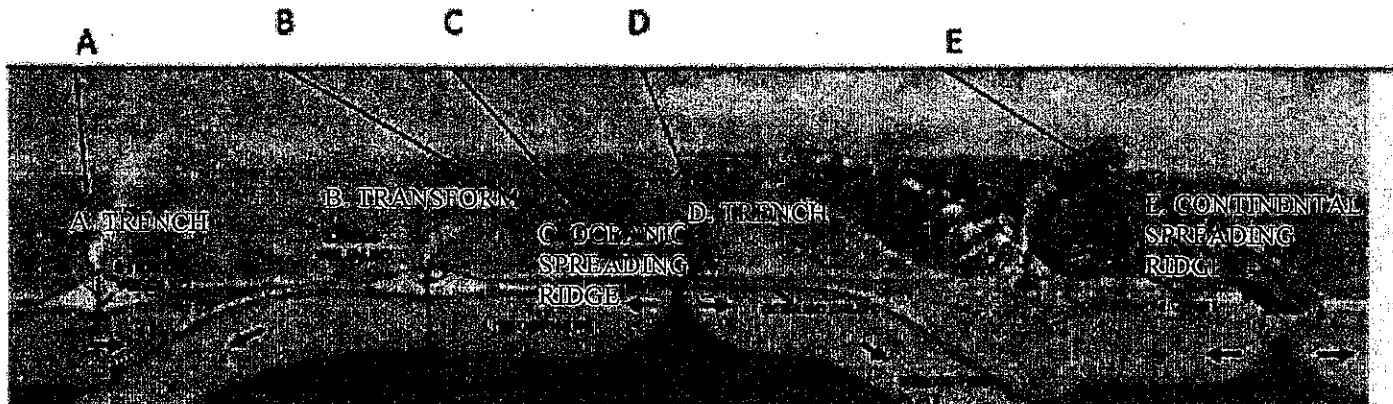
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

- ① Lack of proper disaster control policies / strategies (knowledge)

STUDENT ID #: A40543777; GROUP #: P

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- ☒ a. Dissolved load
- b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

D for Calcium Question

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- a. Continental rocks are less dense than oceanic rocks.
- ☒ b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A40543777; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

Both involve the ~~expanding~~ release of gases to cause upward movement.

- B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:

They both involve the releasing of gases.

STUDENT ID #: A40543777; GROUP #: 1000000

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

From the view of a scientist, the Japanese earthquake was much worse on a scale of power - the Richter scale. The Japanese Earthquake was record breaking at 8.9 but was still less devastating to the people. The Haitian Earthquake was worse because of the population density where the Haitian earthquake had the greatest impact. Another factor that lead to more deaths from the Haitian earthquake is the fact that Haiti is a third-world country that suffers from poverty and poor infrastructure.

STUDENT ID #: A40543777; GROUP #: P

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy is the rise or flotation of one material on another material. Buoyancy as it deals with the inner-working of the earth is the rising of magma closer to the surface over all the denser materials inside the Earth. The buoyancy on magma changes as the magma rises because the outer layers of the Earth are cooler and denser than the areas closest to the core. As the magma rises further from the core, its buoyancy changes due to these density and thermal changes of the consistency of the Earth.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

Poor construction / Lack of safety standards (Prevention)

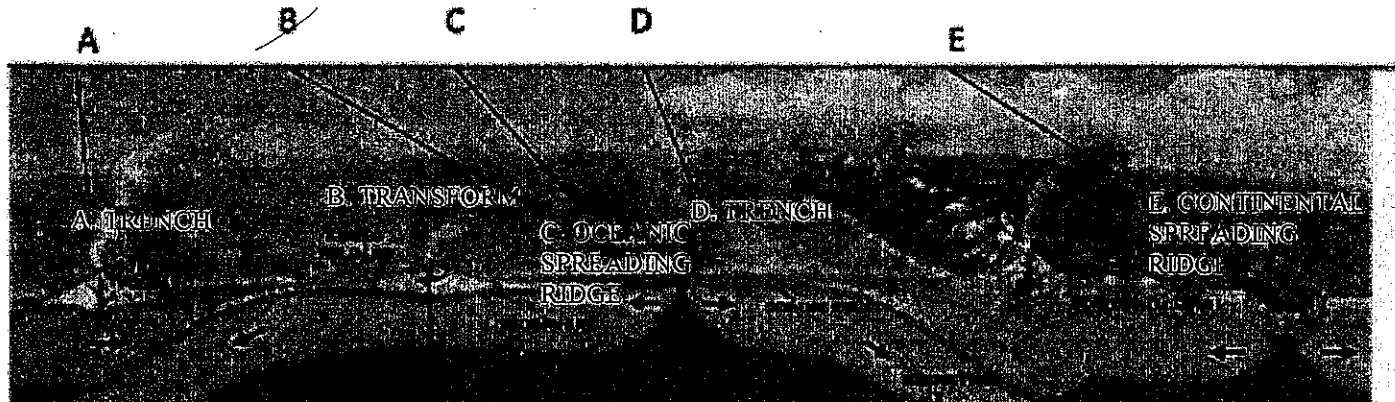


STUDENT ID #: A43143418; GROUP #: 6

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?

A



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

A

- ☒ a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

B

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

C

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- ☒ c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

4A

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

A

- ☒ a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

A

STUDENT ID #: A43143418; GROUP #: Q

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- C  
a. 7.0  
b. 8.0  
c. 9.0  
d. 10.0

8. What type of energy drives slab pull?

- A  
a. Gravitational energy  
b. Thermal energy  
c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- d  
a. Buoyancy will occur when two materials of differing temperature interact.  
b. Buoyancy will occur when two materials of differing structure interact.  
c. Buoyancy will occur when two materials of differing phase interact.  
d. Buoyancy will occur when two materials of differing density interact.  
e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- 3  
a. The movement of seismic waves through water  
b. The undersea displacement of water  
c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- A  
a. Magma erupting and a hot air balloon rising  
b. Magma erupting and an airplane lifting off  
c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

Magma erupting + air balloon rising both happen because they are less dense than the material surrounding them.

B. Which of the following are most similar?

- C  
a. Photosynthesis and respiration  
b. Photosynthesis and burning coal  
c. Respiration and burning coal

Please explain your response to B.:

Both coal burning and respiration deal with a change in form.  
solid → gas    liquid → gas

STUDENT ID #: A43143418; GROUP #: Q

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- a. A discussion of the approximate magnitudes of each earthquake
  - b. A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The earthquake in Japan was approximately a level 9, killing few people for an earthquake of that magnitude. Because Japan is a developed nation, they have the money to install springs underneath many of their buildings, so that they will shift with the earth & decrease the chance of collapsing. Since Japan is very prone to earthquakes this is very necessary.

The earthquake in Haiti was about a magnitude 7. Because Haiti is often hit by hurricanes, not earthquakes, they build their buildings out of cement, which is cheap and holds up during hurricanes, but not during earthquakes. Because poverty is so prevalent in Haiti, they do not have the means to prepare like Japan did.

STUDENT ID #: A43143418; GROUP #: Q

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy is defined as the difference in density of an object and the density of the matter the object is surrounded by. As a magma rises toward the earth surface, the heat from the magma is transferred to the surrounding subduction zone. The magma then becomes cooler. As we learned, the cooler an object is, the less dense it is. The warmer an object is, the less dense it becomes. As the magma becomes less warm, its density increases, slowing its rise to the earth's surface.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake? - The water from the flood made them

- the protection around it wasn't prepared to handle an earthquake with a 9 magnitude.

unstable.

STUDENT ID #: A43414990; GROUP #: Q

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?

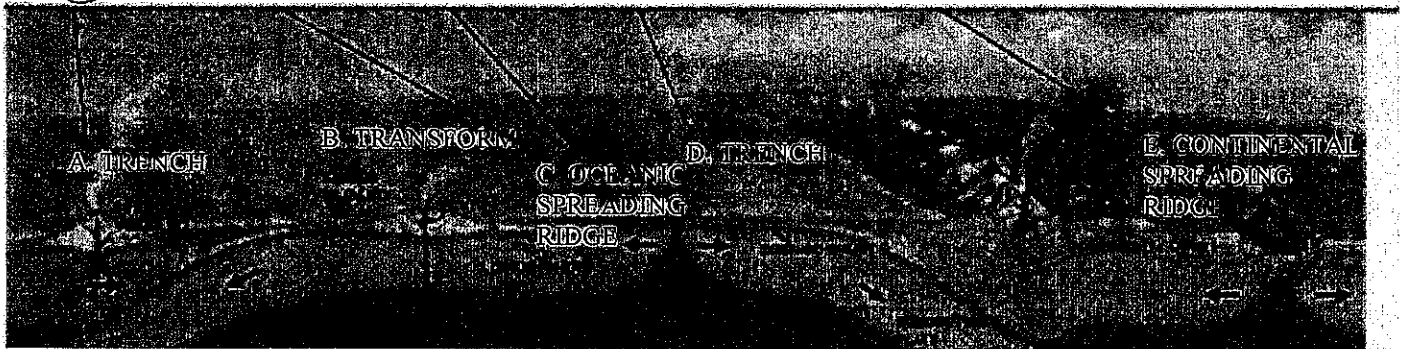
A

B

C

D

E



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

\* Question 4A  
D

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

ISP 203A: GLOBAL CHANGE  
EXAM #2; Sibley/Libarkin, Spring 2011; 100 points

2

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- a. 7.0
- b. 8.0
- ☒ c. 9.0
- d. 10.0

A 8. What type of energy drives slab pull?

- ☒ a. Gravitational energy
- b. Thermal energy
- c. Chemical energy

D 9. Which of the following is the most general correct explanation of buoyancy?

- a. Buoyancy will occur when two materials of differing temperature interact.
- b. Buoyancy will occur when two materials of differing structure interact.
- c. Buoyancy will occur when two materials of differing phase interact.
- ☒ d. Buoyancy will occur when two materials of differing density interact.
- e. Buoyancy will occur when two materials of differing composition interact.

B 10. Which of the following can cause a tsunami?

- a. The movement of seismic waves through water
- ☒ b. The undersea displacement of water
- c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising
- b. Magma erupting and an airplane lifting off
- c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

When magma erupts it is going through degassing & that's the same for a hot air balloon

C B. Which of the following are most similar?

- a. Photosynthesis and respiration
- b. Photosynthesis and burning coal
- ☒ c. Respiration and burning coal

Please explain your response to B.:

Both respiration & burning coal use oxygen & produce CO<sub>2</sub>.

STUDENT ID #: 1A43414990; GROUP #: B

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

Japan	Haiti
9.0	7.0

Although the magnitude of the Haitian earthquake was a 7.0 & the Japanese earthquake it was a 9.0, the Haitian earthquake was a lot worse. It was a lot worse because the buildings in Haiti weren't built to withstand an earthquake of that size. Buildings in Haiti were made of cement & the cement cracked easily. Since then we have learned to better build in areas where an earthquake is likely to occur.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy is what makes an object float or sink. Colder things are more dense, so they typically sink. Warmer things are less dense so they tend to rise. Buoyancy changes as magma rises, because magma is less dense than the surrounding rock. Therefore, it will rise. But when magma rises it usually melts the surrounding rock, but not enough for the magma to become more dense. When magma cools down, the surrounding rock also cools, but again not enough to become less dense than the magma. As magma rises, it is less dense, therefore more buoyant, so it will rise.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

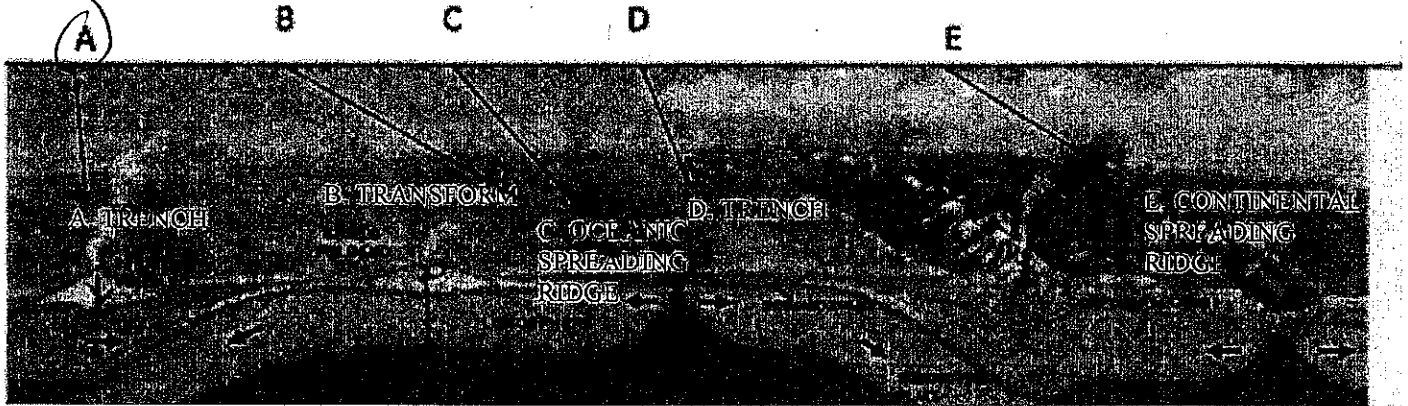
made of cement



STUDENT ID #: A43361981; GROUP #: Q

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- B
- a. Continental crust does not melt very well at convergent boundaries.
  - ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- B
- a. Dissolved load
  - ☒ b. Suspended load
  - c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- A
- ☒ a. A = compaction, B = oxidation, C = photosynthesis
  - b. A = burial, B = respiration, C = weathering
  - c. A = burial, B = oxidation, C = photosynthesis
  - d. A = compaction, B = degassing, C = photosynthesis

4A D

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- C
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- A
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A43361491; GROUP #: Q

- C
7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
- A
8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
- D
9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
- B
10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A
- A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
Answer A is similar because magma and a hot air balloon rise due to heat and they are less dense than the surrounding area.

- A
- B. Which of the following are most similar?
- ☒ a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - c. Respiration and burning coal

Please explain your response to B.:  
A is similar because plants use the sunlight for photosynthesis and CO<sub>2</sub> for respiration.

STUDENT ID #: AU3361991; GROUP #: Q

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- a. A discussion of the approximate magnitudes of each earthquake
  - b. A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

Even though the magnitude of the Japan Earthquake was a 9.0 compared to Haiti's 7.0 (I believe), Haiti's earthquake was much more devastating due to the structures of the buildings. Japan's buildings structure allowed the buildings to move in a sense because their buildings were built with more modern material that had 'springs' in the floors to allow the building to sway, causing it to not crumble. Haiti's buildings were less modern and they were built primarily with concrete. This made the buildings rigid and they could crumble under lesser conditions. This caused the death toll to spike.

STUDENT ID #: A43361981; GROUP #: 2

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy is the force of what happens when 2 things have different densities than each other. For example, an icecube has a density of about 0.9 while water has a density of about 1. This causes the icecube to float to the surface with 10% of the icecube above the surface of the water. The same principle applies to magma. When magma first starts its climb to the surface, it is very hot with possibly airbubbles in it. As it rises, the magma is starting to cool off and lose air bubbles causing it to get less and less dense. However, the magma is still less dense than the rock around it so it keeps climbing. When magma reaches the surface and breaks through, this is when volcanoes form.

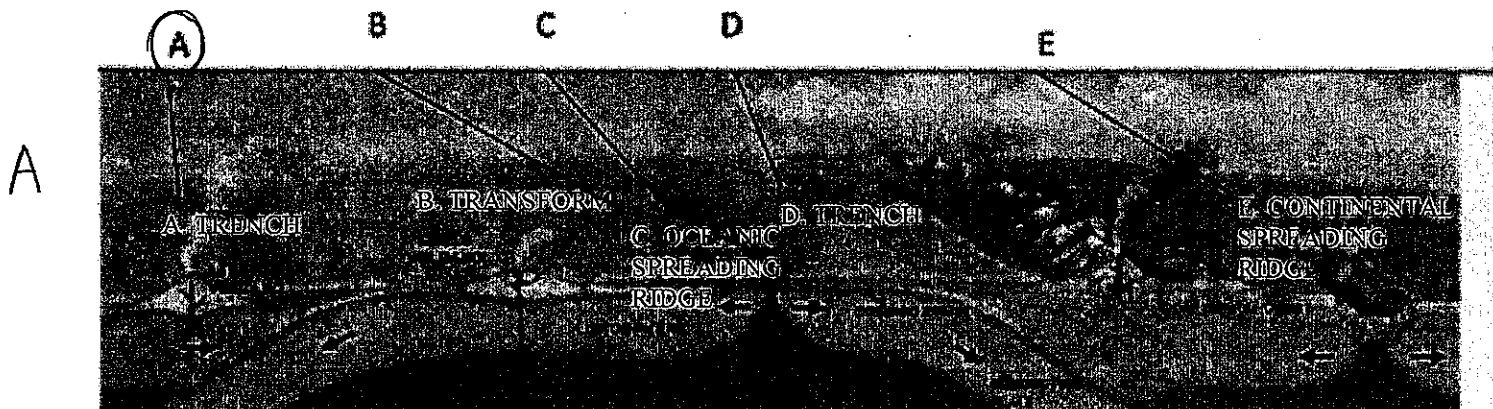
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

It was only built for an 8.0 magnitude earthquake and the earthquake was very powerful which is rare.

STUDENT ID #: A43628897; GROUP #: Q

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- B
- a. Continental crust does not melt very well at convergent boundaries.
  - ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- B
- a. Dissolved load
  - ☒ b. Suspended load
  - c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- A
- ☒ a. A = compaction, B = oxidation, C = photosynthesis
  - b. A = burial, B = respiration, C = weathering
  - c. A = burial, B = oxidation, C = photosynthesis
  - d. A = compaction, B = degassing, C = photosynthesis

#4A  
E

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- C
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- A
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A43628397; GROUP #: Q

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- C
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0

8. What type of energy drives slab pull?

- A
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- D
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- B
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- A
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

The temperature heats up while the magma/balloon is stationary and when the density is small enough it erupts or rises.

B. Which of the following are most similar?

- C
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:

Both are taking one substance and then chemically changing it to something else other than what it was originally

STUDENT ID #: A43628397; GROUP #: Q

**SHORT ANSWER. 25 points each (50 points total)**

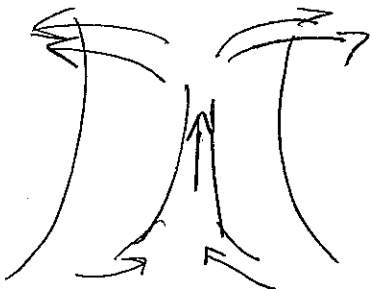
1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The earthquake in Japan had a magnitude of 9.0, whereas the earthquake in Haiti was only a 7.0 (both were still very deadly). The earthquake in Japan also took down a nuclear power plant as well which added to the death toll and will continue to add to the death toll as the effects of the radiation in the air begin to appear. Japan is much more populated and is home to more business and buildings making destruction even greater than that of the earthquake in Haiti.

STUDENT ID #: A43628397; GROUP #: Q

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy occurs when two materials of differing density interact. As magma heats up more and more it becomes less dense and therefore more buoyant than the other more dense materials below it. The buoyancy changes as magma rises because the magma is continuously changing temperature.



EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

The earthquake was a 9.0 which is higher than a plant should be built to withstand, as this magnitude wasn't seen in Japan before.



STUDENT ID #: A40711436; GROUP #: R

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest? Trench, subducting plates, convergent boundaries
- ☒ A      B      C      D      E



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

☒ a. Continental crust does not melt very well at convergent boundaries.  
☒ b. Continental crust is so thick that melt cools before it reaches the surface.  
☐ c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

☒ a. Dissolved load  
☐ b. Suspended load  
☒ c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

☒ a. A = compaction, B = oxidation, C = photosynthesis  
☐ b. A = burial, B = respiration, C = weathering  
☐ c. A = burial, B = oxidation, C = photosynthesis  
☒ d. A = compaction, B = degassing, C = photosynthesis

4A:) A

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

☒ a. Ocean-continent transform boundary  
☐ b. Ocean-ocean divergent boundary  
☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

☒ a. Continental rocks are less dense than oceanic rocks.  
☐ b. Oceanic rocks are less dense than continental rocks.  
☐ c. Continental rocks are warmer than oceanic rocks.  
☐ d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
9. Which of the following is the most general correct explanation of buoyancy?
- ☒ a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
10. Which of the following can cause a tsunami?
- ☒ a. The movement of seismic waves through water
  - b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
Magma erupts because it is less dense than surrounding rock material, which causes the magma to cont. to rise. The same concept w/ a hot air balloon because the hot air in the hot air balloon is less dense than the surrounding air.

- B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - ☒ b. Photosynthesis and burning coal
  - c. Respiration and burning coal

~~Photosynthesis relies on the CO<sub>2</sub> from the~~

Please explain your response to B.:  
They rely on the other one. Photosynthesis is giving off oxygen & the respiration is taking from the atmosphere is giving off carbon dioxide which this is what plants need in order for photosynthesis to occur.

STUDENT ID #: ✓ A40711436; GROUP #: R

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

Earthquakes tend to be stronger at subduction <sup>zones</sup> as well as more powerful in deeper convergent (ocean-cont) plate boundaries. The Haitian Earthquake was a lower magnitude than the Japan Earthquake, however the Haitian earthquake occurred at the ocean-continent convergence, whereas the Japan earthquake was also an ocean-cont. convergent boundary. The deeper the trench the greater the impact the Earthquake will have.

The socioeconomic factors <sup>of Haiti</sup> are relatively low meaning they live at a lower economic level than Japan. Living in an area with low socioeconomic factors can have a major effect on the difference in death tolls. The resources that are available for safety precautions, protective strategies, & clean-up removal are limited to the people in Haiti. These people had to wait longer for adequate resources and adequate equipment to begin the clean-up process.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy causes material to rise or fall due to their relative densities & temperature also plays a role as well. As the magma is rising there is change in buoyancy because the surrounding rock (denser material) is falling below the magma which is less dense than the surrounding rock & is pushing the magma up near the surface. The temperature also plays a vital role in the principle of buoyancy because the hotter magma is, the less dense it becomes. Molecules at hotter temps are moving faster & spreading out, whereas the surrounding rock is colder and the molecules are much closer together. (more dense).

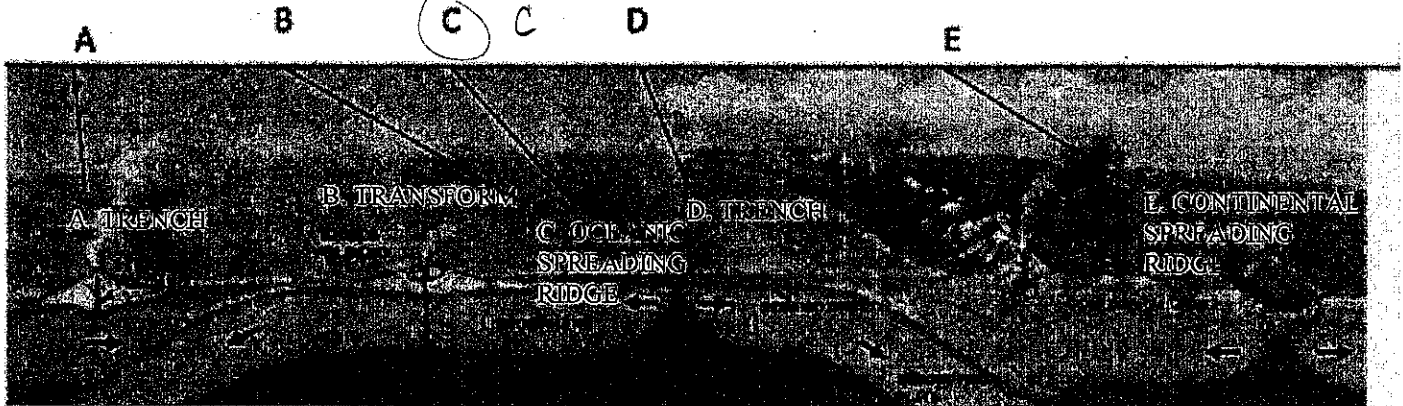
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

- It was only built to withstand earthquakes w/ a 7.0 magnitude.
- The tsunami caused many buildings including the nuclear power plant to fall.

STUDENT ID #: A40688630; GROUP #: R

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- ☒ c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- ☒ c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

A B C D E

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

magma

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?  
a. 7.0  
b. 8.0  
C c. 9.0  
d. 10.0
8. What type of energy drives slab pull?  
A a. Gravitational energy  
b. Thermal energy  
c. Chemical energy
9. Which of the following is the most general correct explanation of buoyancy?  
a. Buoyancy will occur when two materials of differing temperature interact.  
b. Buoyancy will occur when two materials of differing structure interact.  
c. Buoyancy will occur when two materials of differing phase interact.  
D d. Buoyancy will occur when two materials of differing density interact.  
e. Buoyancy will occur when two materials of differing composition interact.
10. Which of the following can cause a tsunami?  
A a. The movement of seismic waves through water  
B b. The undersea displacement of water  
c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?  
a. Magma erupting and a hot air balloon rising  
b. Magma erupting and an airplane lifting off  
c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

magma is heated and becomes less dense than the stuff around it, begins to rise, rises through upward, as it is rising pressure is being released. It begins to cool and it will keep rising until its density is more than its surroundings.  
Hot air balloon heats up the molecules in the balloon making them vibrate faster, heat up and break bonds to decrease density, the balloon rises until the molecules are the same density of the air around it or more, when more it sinks.

- B. Which of the following are most similar?  
a. Photosynthesis and respiration  
b. Photosynthesis and burning coal  
C c. Respiration and burning coal

↑  
in O<sub>2</sub> (energy)  
↓  
releases CO<sub>2</sub>  
↑  
gets energy from heat  
↓  
(oxidation)  
releases CO<sub>2</sub>

Please explain your response to B.:

Respiration and burning coal (oxidation) are the exact same process except burning contacts its energy from the heat, while respiration

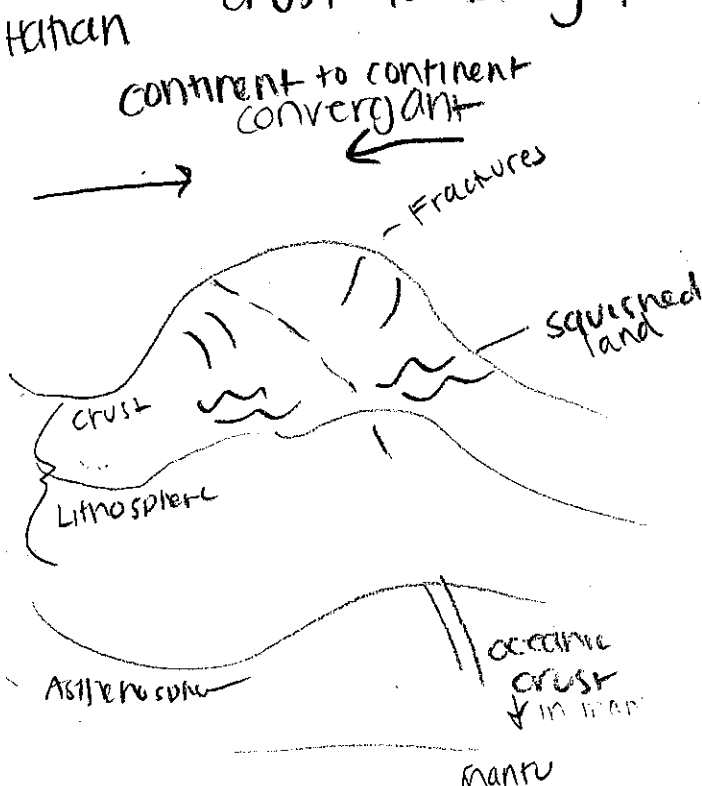
STUDENT ID #: A40688630; GROUP #: R

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The magnitude of the earthquake in Japan was a 9. It occurred due to subduction of converging oceanic ~~boundary~~ plates. This convergence at 2 oceanic plate boundaries created a series of deep sea quakes which are the most explosive. Although the magnitude of Japan's earthquake was more, less people were killed because it was a deep sea earthquake.

The Haitian earthquake occurred from 2 continental plate boundaries which when converging together squish the land and will continue to push together forming deadly cracks swallowing cities. Also, the oceanic crust is being pushed down towards the mantle.



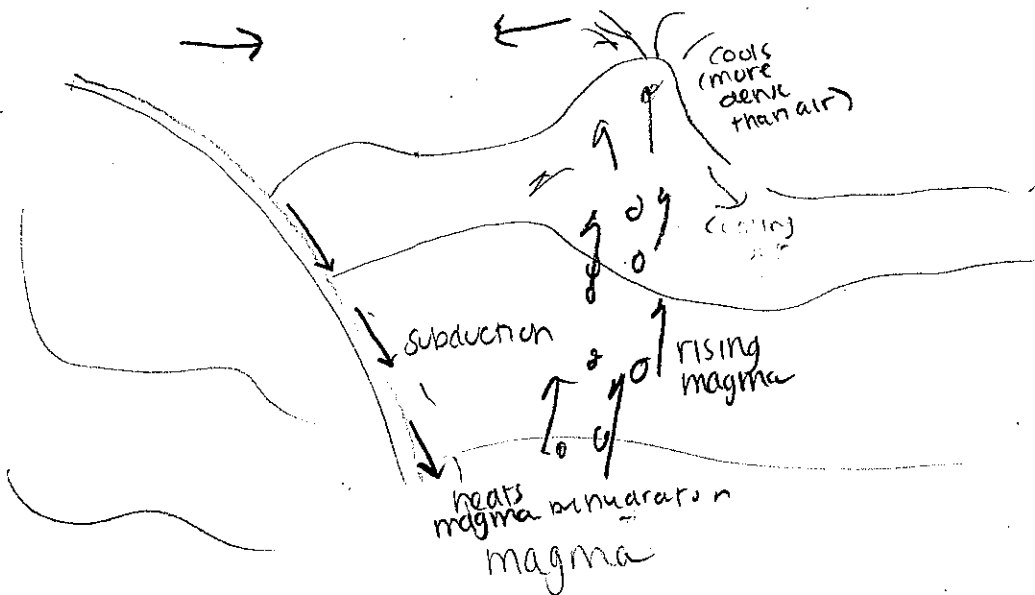
STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

BUOYANCY is the rising or falling of a material due to its density, compared with the density of the material it is surrounded by. The more buoyant a material the more dense, the thicker.

Magma becomes heated when subduction occurs (pulling mud down + water, hydrating and heating the magma increasing temperature and pressure so it rises upwards through the rock layer b/c it is more dense. It continues to rise, eventually cooling more as it surfaces and stops rising when its buoyancy is the same or less than the matter around it.



EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

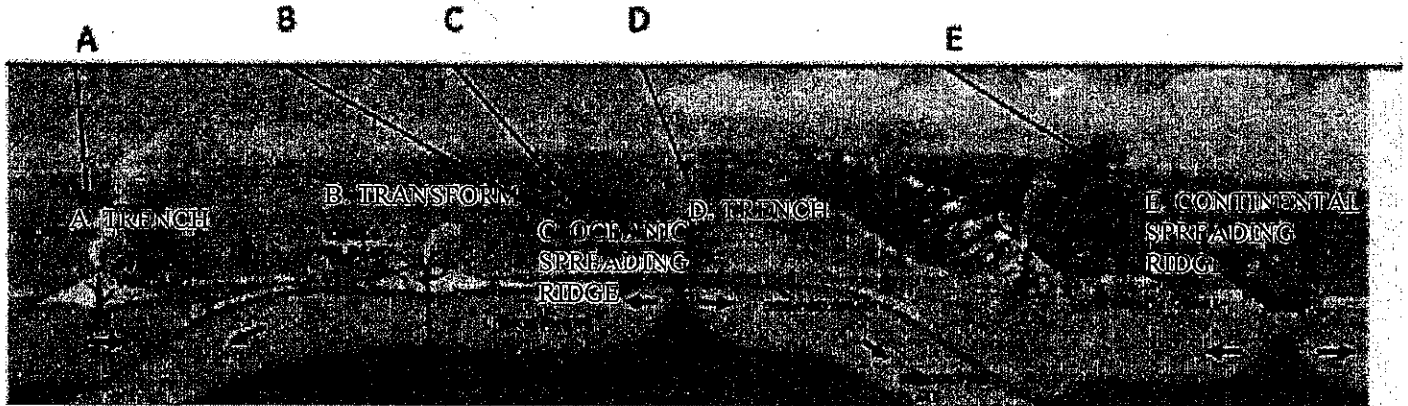
They were swallowed by water they weren't made to withstand force of water.



STUDENT ID #: A40994271; GROUP #: R

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- ☒ c. Continental crust overlies mantle that is too cold for much melting to occur.

C

3. Which of these carries the most material in streams?

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

B

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- ☒ b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, c = photosynthesis
- d. A = compaction, B = degassing, c = photosynthesis

4a) A

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

C

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

A

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- C  
a. 7.0  
b. 8.0  
c. 9.0  
d. 10.0

8. What type of energy drives slab pull?

- A  
a. Gravitational energy  
b. Thermal energy  
c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- D  
a. Buoyancy will occur when two materials of differing temperature interact.  
b. Buoyancy will occur when two materials of differing structure interact.  
c. Buoyancy will occur when two materials of differing phase interact.  
d. Buoyancy will occur when two materials of differing density interact.  
e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- B  
a. The movement of seismic waves through water  
b. The undersea displacement of water  
c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- A  
a. Magma erupting and a hot air balloon rising  
b. Magma erupting and an airplane lifting off  
c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
the reason that they are most similar is because the gas bubbles that fill a volcano is like helium for a balloon, both are needed to help the magma rise or balloon rise.

B. Which of the following are most similar?

- C  
a. Photosynthesis and respiration  
b. Photosynthesis and burning coal  
c. Respiration and burning coal

Please explain your response to B.:  
they are similar because they both breathe in oxygen and breathe out carbon dioxide

STUDENT ID #: A40994271; GROUP #: R

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:

- a. A discussion of the approximate magnitudes of each earthquake
- b. A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

a) the magnitudes of both earthquakes were 9.0.  
b) the differences in the socioeconomic & environmental factors that contributed to the relative difference in death tolls is that Japan already had barriers to eliminate the intensity of the earthquake where as Haiti had nothing to stop or prevent the tsunami from being as intense.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

A. Buoyance is the difference in weight of a floating object. Ex: the rubber ducky is more buoyant in the water than the metal fork.

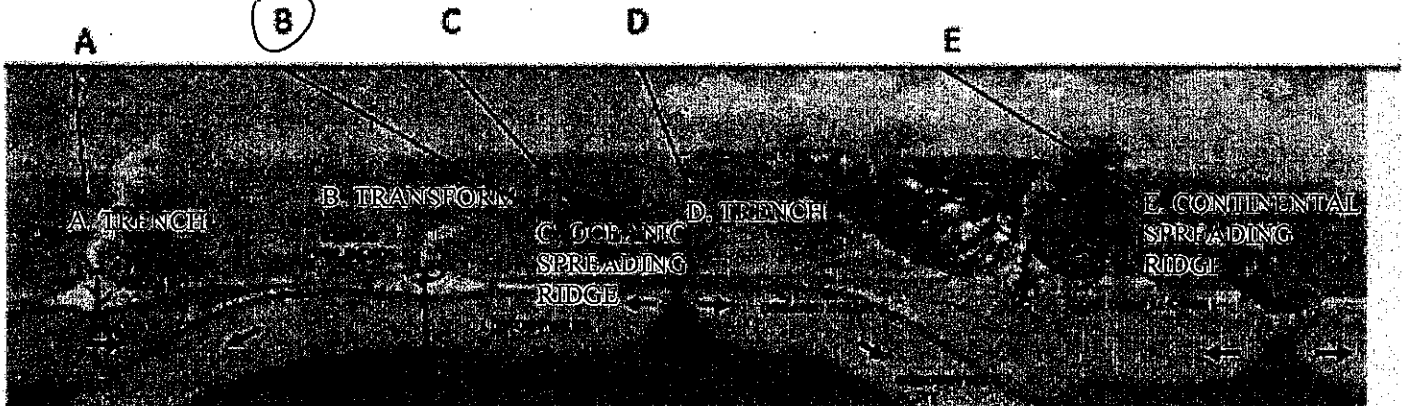
B. Buoyancy changes as magma rises because when the subduction scrapes the mud into the ring of fire, then it brings the water down and then brings up the magma and it rises through allowing it to be less dense & more buoyant and able to push through to the top of the more dense materials. so, the normally more buoyant materials like the lithosphere and the asthenosphere become less buoyant because they are pushed down a little bit.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

STUDENT ID #: A39979826; GROUP #: D

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- B 1. At which boundary is the ocean likely to be deepest?



- C 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?
- a. Continental crust does not melt very well at convergent boundaries.
  - b. Continental crust is so thick that melt cools before it reaches the surface.
  - ☒ c. Continental crust overlies mantle that is too cold for much melting to occur.

- C 3. Which of these carries the most material in streams?
- a. Dissolved load
  - b. Suspended load
  - ☒ c. Bed load

- A 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

Question 4A

Answer: D

- C 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - ☒ c. Continent-ocean convergent boundary

- A 6. Why do continents never subduct under oceans?
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A39979826 ; GROUP #: R

A. 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

☒ a. 7.0

☐ b. 8.0

☐ c. 9.0

☐ d. 10.0

A. 8. What type of energy drives slab pull?

☒ a. Gravitational energy

☐ b. Thermal energy

☐ c. Chemical energy

D. 9. Which of the following is the most general correct explanation of buoyancy?

☐ a. Buoyancy will occur when two materials of differing temperature interact.

☐ b. Buoyancy will occur when two materials of differing structure interact.

☐ c. Buoyancy will occur when two materials of differing phase interact.

☒ d. Buoyancy will occur when two materials of differing density interact.

☐ e. Buoyancy will occur when two materials of differing composition interact.

C. 10. Which of the following can cause a tsunami?

☐ a. The movement of seismic waves through water

☐ b. The undersea displacement of water

☒ c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. A. Which of the following are most similar?

☒ a. Magma erupting and a hot air balloon rising

☐ b. Magma erupting and an airplane lifting off

☐ c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

Both materials are ~~less~~ less dense & therefore melt/erupt or rise.

A. B. Which of the following are most similar?

☒ a. Photosynthesis and respiration

☐ b. Photosynthesis and burning coal

☐ c. Respiration and burning coal

Please explain your response to B.:

Both release energy into the air through a specific process.

STUDENT ID #: A39979826; GROUP #: R

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- a. A discussion of the approximate magnitudes of each earthquake
  - b. A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Haitian earthquake was much deadlier than the Japanese earthquake because the magnitude of the earthquakes were different. After/during an earthquake an assessment is made to determine where the earthquake falls on the richter scale. In these two specific earthquakes the Haitian rated higher on the scale than the earthquake in Japan. The environment ~~the~~ & the surroundings also play a big role when determining the effects of the earthquake. If the location is surrounded by a large body of water it can cause different effects versus not being around any large body of water.

STUDENT ID #: A39979826; GROUP #: R

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy is determined by the amount of density an object has. Buoyancy changes as magma rises because the temperature of the magma decreases as it rises which causes the density of the magma to change which in turn changes the buoyancy. Therefore, as the magma rises to the earth's surface the temperature changes which alters the density of the magma & ultimately changes the buoyancy.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

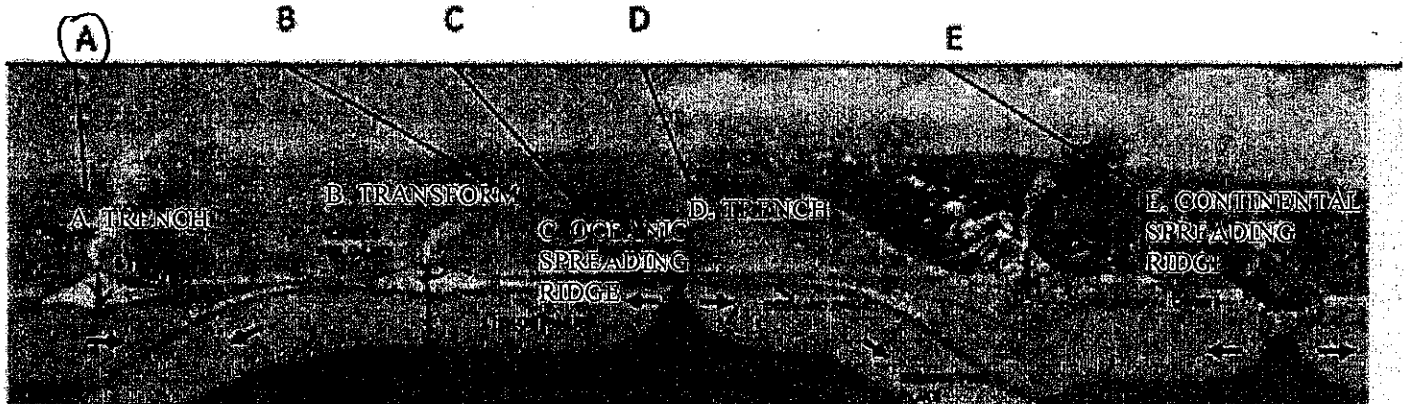
1. The location of the plant was insufficient
2. Japan wasn't aware they would also have a tsunami



STUDENT ID #: 43294133; GROUP #: 5

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- ☒ a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

4A.  
a

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011? *5th largest*

- < 7.9*
- ~~a. 7.0~~
  - ☒ b. 8.0
  - c. 9.0
  - ~~d. 10.0~~

8. What type of energy drives slab pull?

- ☒ a. Gravitational energy
- b. Thermal energy
- c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- a. Buoyancy will occur when two materials of differing temperature interact.
- b. Buoyancy will occur when two materials of differing structure interact.
- c. Buoyancy will occur when two materials of differing phase interact.
- ☒ d. Buoyancy will occur when two materials of differing density interact.
- e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- a. The movement of seismic waves through water
- ☒ b. The undersea displacement of water
- c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising
- b. Magma erupting and an airplane lifting off
- c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
Magma & hot air balloon become heated & the molecules in them expand, making them less dense. They both rise due to buoyancy & the density differences b/w the magma & lithosphere / balloon & atmosphere.

B. Which of the following are most similar?

- ☒ a. Photosynthesis and respiration
- b. Photosynthesis and burning coal
- c. Respiration and burning coal

Please explain your response to B.: In photosynthesis, plants take in CO<sub>2</sub> for energy and release oxygen. Respiration, we take in oxygen for energy & release CO<sub>2</sub>. They both involve an exchange of gasses.

STUDENT ID #: A43294133; GROUP #: S

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

A. Japan's Earthquake, being the 5th largest, had a greater magnitude than Haiti's earthquake, yet Haiti suffered a greater devastation than Japan. How could this be possible?

B. Haiti suffered a greater loss because of their socioeconomic status. There was much more building destruction and death from the Haiti earthquake because they didn't have enough money & resources to develop a society able to withstand a large earthquake. Japan had the proper resources to construct a good earthquake prevention system. They built their buildings on springs under the ground so they ~~at~~ weren't destroyed in the earthquake. They also had a good alert system where they were able to send messages out to their citizens to warn them of the upcoming tsunami, which gave several people around eight minutes to evacuate. Haiti, because of their lack of money, had not developed any of the new technologies or systems to help them in an earthquake or tsunami like Japan did. Thus, they had larger death tolls and more destruction than Japan, even though Japan's earthquake had a larger magnitude.

(Their buildings weren't as sturdy)

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

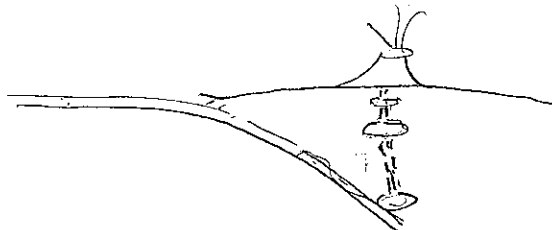
2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

1. Buoyancy is what occurs when there are objects with density differences that interact. Buoyancy is the force at work when magma from the mantle rises to Earth's surface.

The density of magma initially changes due to temperature changes. When magma is heated, it becomes less dense, eventually to a point when it is less dense than the surrounding mantle.

Because of buoyancy, the less dense material (magma) will rise against the more dense material (surrounding mantle). The dense material flows underneath the magma and also helps it rise by pushing it up. Once the magma gets closer to the Earth's surface, where temperature is cooler, it will cool down and increase in density. Depending on the density of the surrounding lithosphere, and due to buoyancy differences, the magma will rise ~~more~~ slower than before or may even stop rising. In this situation, the differences in density b/w the magma & surrounding lithosphere weren't as great, so the buoyant forces were working less.



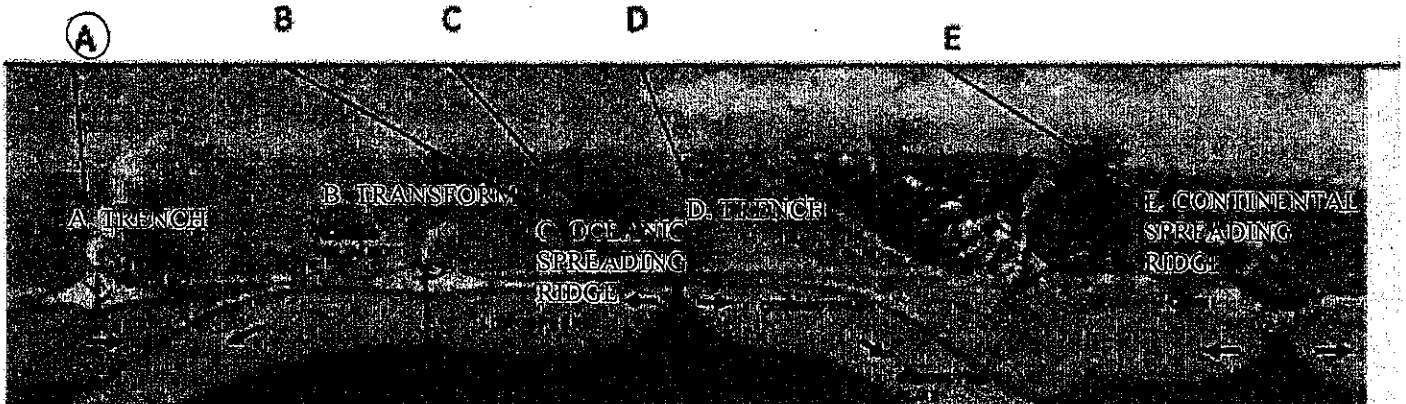
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

The power plant was only built to withstand an earthquake of 7.9 magnitude & the Japan earthquake was greater, & the rods were exposed to hydrogen & it caused an explosion.

STUDENT ID #: A43292970; GROUP #: S

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- A
- a. Continental crust does not melt very well at convergent boundaries.
  - b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- B
- a. Dissolved load
  - b. Suspended load
  - c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- strong credit
- IMPACTION
- a. A = compaction, B = oxidation, C = photosynthesis
  - b. A = burial, B = respiration, C = weathering
  - c. A = burial, B = oxidation, c = photosynthesis
  - d. A = compaction, B = degassing, c = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- C
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- A
- a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- C
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0

8. What type of energy drives slab pull?

- A
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- D
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- B
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake ✕

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- A
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

Magma is less dense than the surrounding rock just like the gas in the hot air balloon is less dense than the surrounding air. This is what causes both to rise in their respective places.

B. Which of the following are most similar?

- C
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:

Both of these release carbon into the atmosphere.

STUDENT ID #: ✓ A43294970; GROUP #: 5

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

Both the Japan and Haitian earthquakes were very serious. However, the Haitian earthquake was much more deadly than the Japanese earthquake. Despite the Haitian earthquake having a magnitude of about 7 (don't remember exactly...), and the Japanese earthquake about a 9.0, why was the Haitian earthquake so much deadlier?

There are several reasons why this happened. First of all, Japan is a country well-accustomed to earthquakes since they occur there frequently. They construct their buildings very carefully with the right materials to avoid destruction of buildings. Actually, they even build their buildings on a slab of rock with springs so that the buildings sway with the rock instead of falling apart.

However, in Haiti, not only do they not have the same economic status as Japan, but they have to build their buildings differently to protect themselves from another natural disaster that Japan does not have to worry about as much—hurricanes. Haiti uses concrete for a lot of their buildings, but when a destructive earthquake strikes and the concrete comes toppling down, more people are going to get hurt.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy describes the relationship between the densities of two different materials that cause them to move relative to one another. Less dense material will always rise in material that is more dense due to these buoyant forces.

When rock melts and magma forms, the magma is less dense than the surrounding rock and will start to rise up towards the surface. As the burning hot magma rises, it starts to cool off, causing its decrease in density. Because its density has gone down, it will rise slower and slower until it has the same density as the surrounding rock and stops rising. At this point, the liquid magma has hardened into a solid. So basically, when magma is rising, its density is decreasing and it's heating up the surrounding rock, causing it to increase its density. The density of the magma will continue to decrease, while the density of the surrounding rock will continue to slightly increase until the two reach equilibrium of density and stops rising. If however, the magma never reaches equilibrium with the surrounding rock and reaches the surface, a volcanic eruption will occur.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

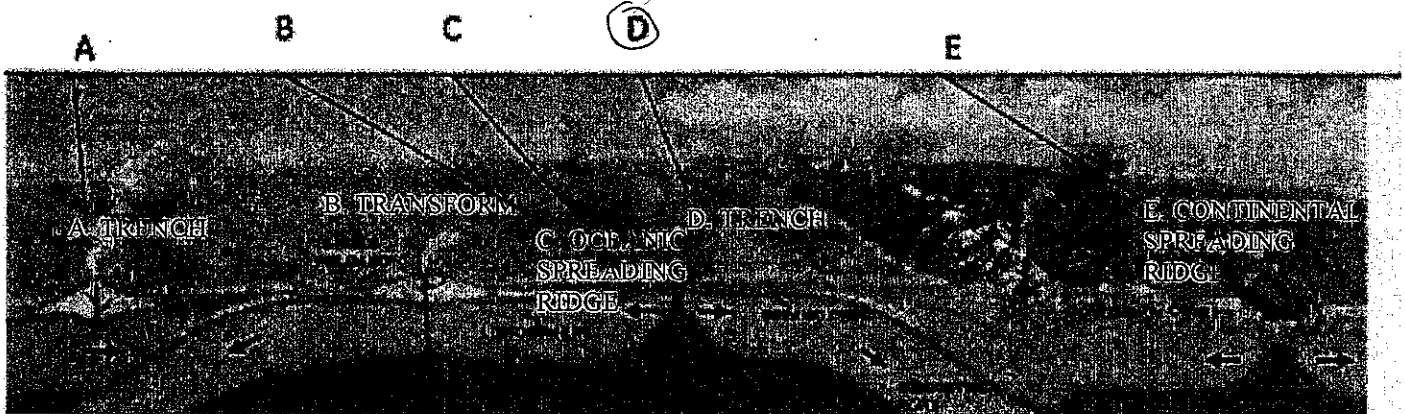
1. Japan only built the protection from radiation leakage to withstand an 8.0 earthquake
2. ???



STUDENT ID #: A13927449; GROUP #: 5

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- ☒ a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
Magma is less dense than the material around it so it rises to the top and erupts. Hot air in the balloon is less dense than the air outside the balloon which causes the hot air balloon to rise.

- B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:  
They both produce oxidation

STUDENT ID #: A13927449; GROUP #: S

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

A. The approximated magnitude of the Japan earthquake was 9.0. The approximated magnitude of the Haitian earthquake was 8.0.

B. The factor that contributed to the relative difference in death tolls in Japan is that the concrete <sup>so far</sup> their buildings were reinforced to withstand earthquakes. They were warned before the tsunami happen due to a device called Seismograph.

In Haiti their concrete ~~in~~ buildings weren't reinforced and only to withstand hurricane and not earthquakes. Another major factor is that Haiti is too poor.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyant force happens when there is a difference of density between two materials. When magma is heated it is filled with gas and that causes it to rise because it is less dense than the material around it. When magma rises to the top it becomes cooler and releases gas that makes it become more dense. Magma will still be rising but at a slower pace because of the slow change of buoyancy.

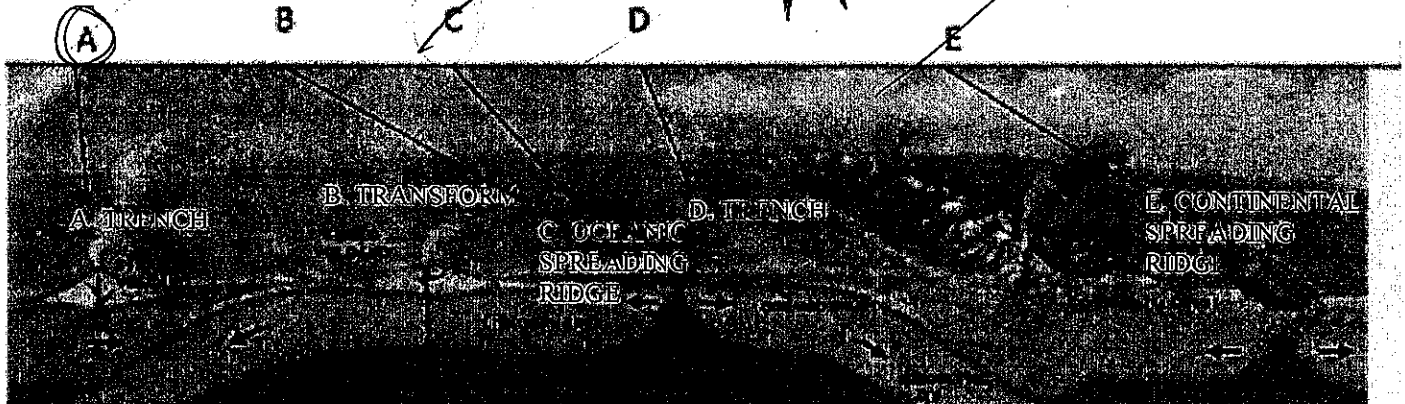
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

It was built with cheap material and to only withstand a 7.9 earthquake.

STUDENT ID #: A43850550 [REDACTED] GROUP #: S

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest? **A**



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- B** a. Continental crust does not melt very well at convergent boundaries.  
b. Continental crust is so thick that melt cools before it reaches the surface.  
c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- B** a. Dissolved load  
b. Suspended load  
c. Bed load

**A** 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- A** a. A = compaction, B = oxidation, C = photosynthesis  
b. A = burial, B = respiration, C = weathering  
c. A = burial, B = oxidation, C = photosynthesis  
d. A = compaction, B = degassing, C = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- C** a. Ocean-continent transform boundary  
b. Ocean-ocean divergent boundary  
c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- C** a. Continental rocks are less dense than oceanic rocks.  
b. Oceanic rocks are less dense than continental rocks.  
c. Continental rocks are warmer than oceanic rocks.  
d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A43856550 GROUP #: S

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- C
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0

8. What type of energy drives slab pull?

- A
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- D
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- A
- ☒ a. The movement of seismic waves through water
  - b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- A
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
The magma gets so hot that its boiling bubbles pop and it shoots, just like when a hot air balloon is suppose to rise it has to heat up and when it is it shoots!

B. Which of the following are most similar?

- C
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:  
Both process, respiration & burning of coal, end with oxidation, or the giving off of oxygen.

STUDENT ID #: A 43856550 ~~123456789~~ GROUP #: S

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

A. The Japan + Haitian earthquake magnitudes were a little different than each other, the Japan Earthquake was an approximate 8.9 on the richter scale, where as the Haitian was above a 9.0 magnitude.

B. The difference between the two Earthquakes was that more people were killed in Haiti in 2010. Haiti is a third-world country, with not a lot of resources, where in comparison Japan is one of the most resourceful places in the world. Japan having more money & more resources spent more money on making sure their country would be safe from natural disasters. Japan was able to send out a signal to the people of their country to warn them to get to higher elevation. The Earthquake of Haiti could have been less deadly if they had more money or resources to have been prepared. The Earthquake in 2010 caught Haiti off guard with no warning and no signal.

STUDENT ID #: A43856550 [REDACTED] GROUP #: S

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

A. Buoyancy is all about density of objects and their environments. If an object is more dense than the liquid it is in, it will sink, meaning it is less buoyant.

B. Magma starts off dense at the inside of a volcano. As the volcano begins to heat up the magma forms bubbles, the bubbles ~~is~~ filled with gases cause the magma to be less dense as it was before. The magma's bubbles ~~do~~ are causing degassing causing the magma on top to be more buoyant than the magma on bottom. Continuing the heating process the magma degasses so much that it erupts.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

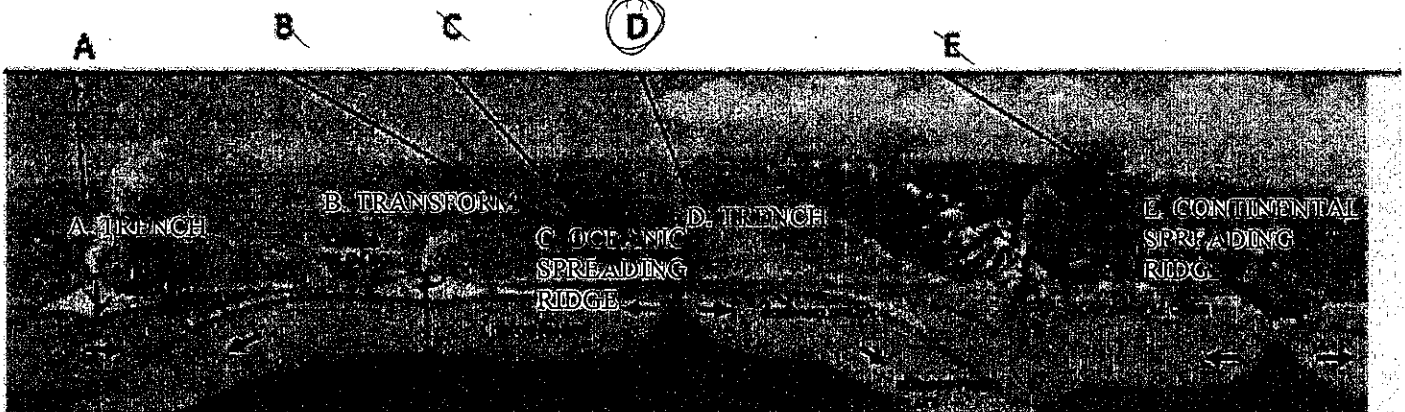
1. They had made the safety net to withstand only an 8.0 earthquake, instead of a larger earthquake.



STUDENT ID #: A44013916; GROUP #: T

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- D 1. At which boundary is the ocean likely to be deepest?



- A 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?
- ☒ a. Continental crust does not melt very well at convergent boundaries.
  - b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

- B 3. Which of these carries the most material in streams?
- a. Dissolved load
  - ☒ b. Suspended load
  - c. Bed load

Extra Credit C 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- ☒ c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

4A) D

- C 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - ☒ c. Continent-ocean convergent boundary
- A 6. Why do continents never subduct under oceans?
- ☒ a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A44013916; GROUP #: T

- C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
- A 8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - ~~c. Chemical energy~~
- D 9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
- B 10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - ~~c. The heating of water during an earthquake~~

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - ~~c. A hot balloon rising and an airplane lifting off~~

Please explain your response to A.:  
When magma erupts gas bubbles are forming causing the magma to rise because it is less dense, just a hot air balloon rises with gas.

- C B. Which of the following are most similar?
- ~~a. Photosynthesis and respiration~~
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:

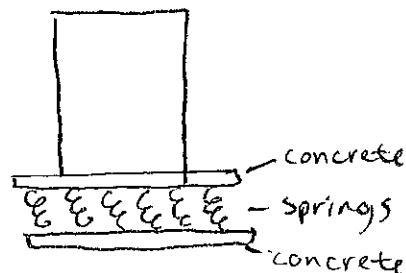
STUDENT ID #: A44013916; GROUP #: T

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

A) The earthquake in Japan was a 9.0 & the earthquake in Haiti was a 9.5. So the earthquake in Haiti had a stronger magnitude.

B) The main reason less people died in Japan than in Haiti was the fact that they were prepared for an earthquake. In Japan the buildings are built on top of concrete with springs underneath, so the buildings can withstand the earthquake. Sort of like this:



In Haiti however, they did not build their buildings like this and not with concrete also. Because, financially, they can't afford to build their buildings like that, and they also don't have the resources for it.

So, more people in Haiti died because of the collapsing of buildings, and in Japan most of the damages are already being fixed.

STUDENT ID #: A44013916; GROUP #: T

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy is when two materials of density interact and the more dense material makes up for the amount displaced by the less dense material.

In magma, when gas bubbles form it creates less dense material than the surrounding material. This causes the magma to rise, meaning there is a buoyant force acting on the magma so it rises. The buoyancy changes as magma rises, because the density of the material (magma & its surrounding) changes. As the magma reaches to the surface & erupts it becomes more dense again changing the buoyancy.

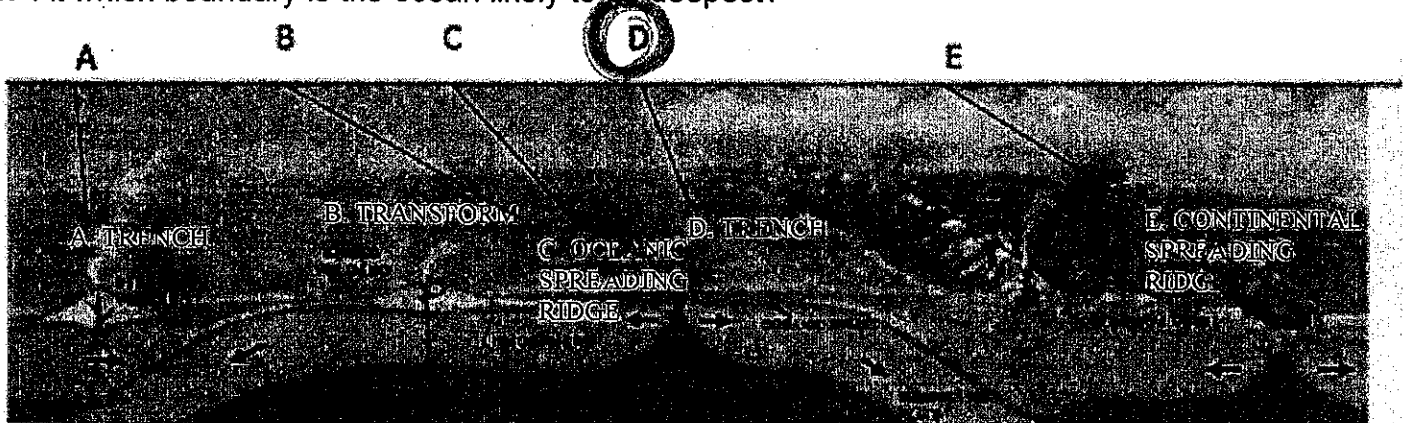
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

The nuclear power plant in Japan was built to only withstand an earthquake with the magnitude of 8.0, since the earthquake in Japan was a 9.0 the nuclear power plant did not stand a chance.

STUDENT ID #: A39743811; GROUP #: T

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- C
- a. Continental crust does not melt very well at convergent boundaries.
  - b. ~~Continental crust is so thick that melt cools before it reaches the surface.~~
  - c. ☒ Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- C
- a. Dissolved load
  - b. Suspended load
  - c. ☒ Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- A
- a. ☒ A = compaction, B = oxidation, C = photosynthesis
  - b. ~~A = burial, B = respiration, C = weathering~~
  - c. ~~A = burial, B = oxidation, C = photosynthesis~~
  - d. A = compaction, B = degassing, C = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- A
- a. ☒ Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- A
- a. ☒ Continental rocks are less dense than oceanic rocks.
  - b. ~~Oceanic rocks are less dense than continental rocks.~~
  - c. ~~Continental rocks are warmer than oceanic rocks.~~
  - d. ~~Oceanic rocks are warmer than continental rocks.~~

STUDENT ID #: A39743811; GROUP #: T

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- ☐ a. 7.0  
☐ b. 8.0  
☒ c. 9.0  
☐ d. 10.0

8. What type of energy drives slab pull?

- ☒ a. Gravitational energy  
☐ b. Thermal energy  
☐ c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- ☐ a. Buoyancy will occur when two materials of differing temperature interact.  
☐ b. Buoyancy will occur when two materials of differing structure interact.  
☐ c. Buoyancy will occur when two materials of differing phase interact.  
☐ d. Buoyancy will occur when two materials of differing density interact.  
☒ e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- ☐ a. The movement of seismic waves through water  
☐ b. The undersea displacement of water  
☒ c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising  
☐ b. Magma erupting and an airplane lifting off  
☐ c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

The eruption of magma is caused because of gas which causes it to rise due to its buoyancy. This is

the same case with a hot air balloon. It rises due to the buoyancy of gas.

B. Which of the following are most similar?

- ☐ a. Photosynthesis and respiration  
☐ b. Photosynthesis and burning coal  
☒ c. Respiration and burning coal

Please explain your response to B.:

Both Respiration & the burning of coal are releasing Carbon

STUDENT ID #: A39743811; GROUP #: T

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

the earthquake in Haiti was a magnitude 7 while the earthquake in Japan was a magnitude 9. The earthquake that occurred in Japan was deeper & could have cause a higher catastrophe but Japan has strict building codes that help prepare & reinforce buildings for acts of nature such as the earthquake. Haiti has very little infrastructure & the buildings are made of concrete because of the multitude of hurricanes that occur. When an earthquake happens concrete structures collapse because there is very little room for movement; this cause people to be caught under the debris & rubble. In Japan buildings are built to withstand earthquakes. Buildings are built on top of a spring sandwich so to speak. Buildings are built on top of a layer of concrete & the sits on top of a bed of springs which sits on top another layer of concrete, this allows buildings to move with earth. Japanese buildings are also re-enforced with steel which a bendable material. Steel is quite expensive & is not used on Haitian buildings due to the cost & availability in Haiti. In Japan when a seismograph detects an earthquake an alert system is sent out to residents giving them approximately 8 minutes to find safe havens. This was not the case with Haiti because this technology is advanced & expensive. The Japanese earthquake was an ocean-ocean convergent & happened below the ocean causing the tsunami.

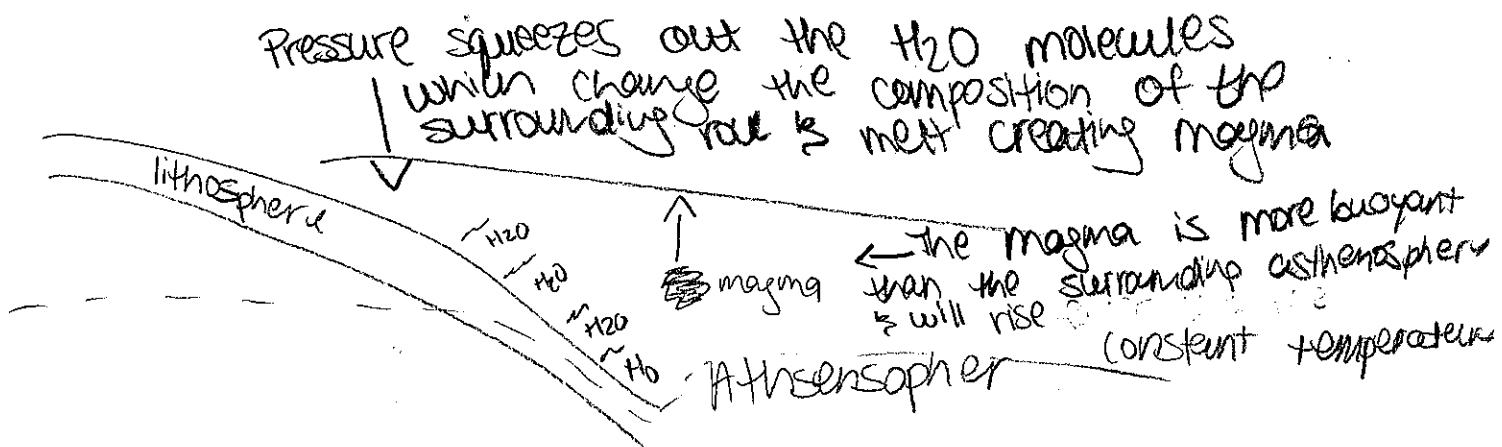
STUDENT ID #: A39743811; GROUP #: T

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy happens through change in composition & is what causes things that are less dense than other things to rise at a faster rate.

Magma is melted rock. Buoyancy will change as magma rise because the surrounding rock is much cooler & will cool the magma as it rises causing it to slow. As the gas is released from the magma it becomes more dense & less buoyant, yet it will still be more buoyant than the surrounding asthenosphere will continue to rise.



EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

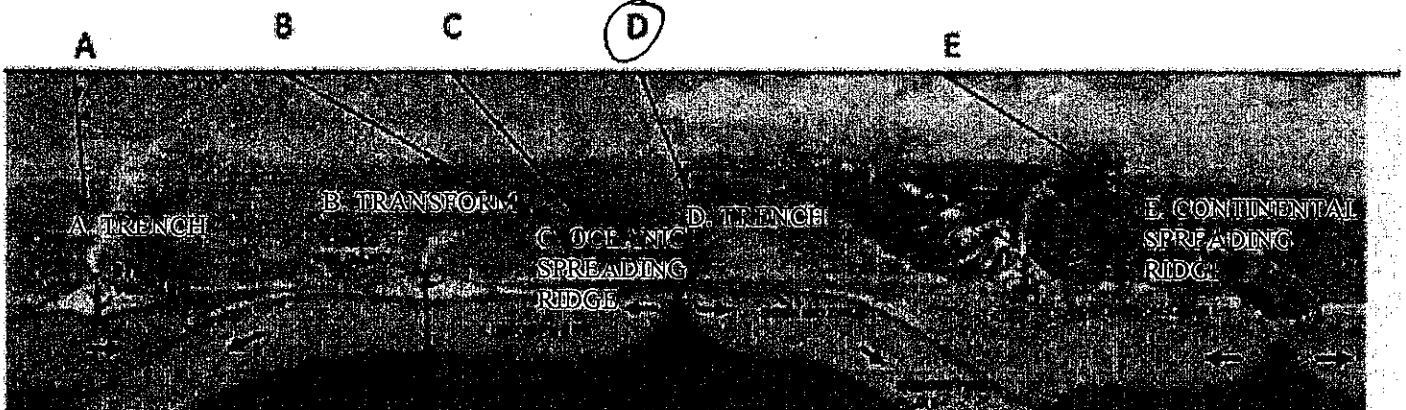
They made it cheap, simple, & easy & the water from the tsunami hit the pipes & caused a reaction because the pressure & erupted.



STUDENT ID #: A42185423; GROUP #: T

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

① 1. At which boundary is the ocean likely to be deepest?



A 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- ☒ a. Continental crust does not melt very well at convergent boundaries.
- b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

B 3. Which of these carries the most material in streams?

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

B 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- ☒ b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

4A. A

C 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

C 6. Why do continents never subduct under oceans?

- a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- ☒ c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A42185423 ; GROUP #: T

- C7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
- A8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
- D9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
- A10. Which of the following can cause a tsunami?
- ☒ a. The movement of seismic waves through water
  - b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
These are alike because of the causative principles. When molecules heat up in the balloon/magma they become less dense and move much faster. When this happens the force & push/expand either the magma/balloon outward & cause it to rise.

- C B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:  
These two things are alike because both of these processes create carbon dioxide.

STUDENT ID #: A42185423; GROUP #: T

SHORT ANSWER. 25 points each (50 points total)

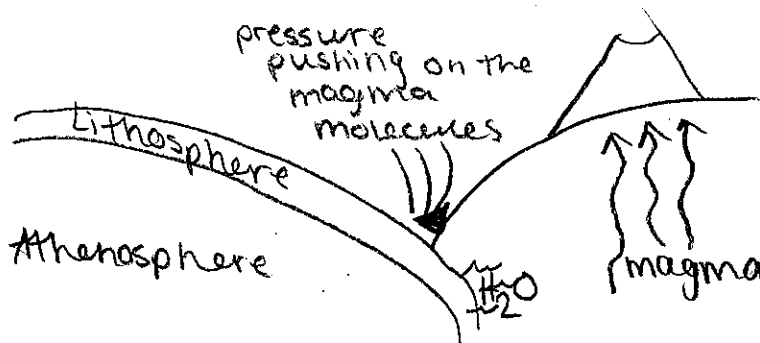
1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. <sup>9.0</sup> <sup>7.0</sup> Explain why the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The earthquake in Japan was a staggering 9.0 magnitude while the magnitude of the earthquake in Haiti was an equally devastating 7.0. Although the magnitude of the Haitian EQ was less than Japan's the death toll in Haiti was much higher, this is due to many reasons. First, environmentally Japan builds their buildings to be more equipt for EQ's, while Haiti builds their to be more equipt to deal with hurricanes/malaria, this is because of the countries geographical location. The homes in Haiti are built with concrete which make them not bendable or shock absorbent. The homes in Japan have an infrastructure built for EQ's. Their buildings are basically built on springs in order to move & absorb the EQ more thoroughly. Socioeconomically Japan is much wealthier & in a better economical state than Haiti currently. That allows them to equipt their buildings better in the case of an EQ. Also, Japan has a seismograph that allows them to send out a warning to all residents of Japan to get to a safe location within 8 minutes. With the beneficial infrastructure of homes & other ammenities to prepare citizens for an EQ, it is easy to see why Japan's death toll is far less than Haiti's. Also Haiti was equipped for a hurricane they are not properly prepared for a natural disaster like an EQ.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy is what causes things to rise and fall due to the relative density of its surrounding materials. When magma heats up it causes the molecules inside it to vibrate faster. This results in the magma becoming less dense than its surrounding materials. The buoyancy changes because of the quicker moving molecules as a result of the magma's heat. The warmer crust is easier to break through and less dense. As the molecules degass and cause the density to decrease they expand the magma and cause it to push up/rise past its cooler/denser surrounding materials.



EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

- 1) The power plant in Japan was only built to withstand a 7.9 EQ
- 2) The Japanese building codes were not up to par.

write letter

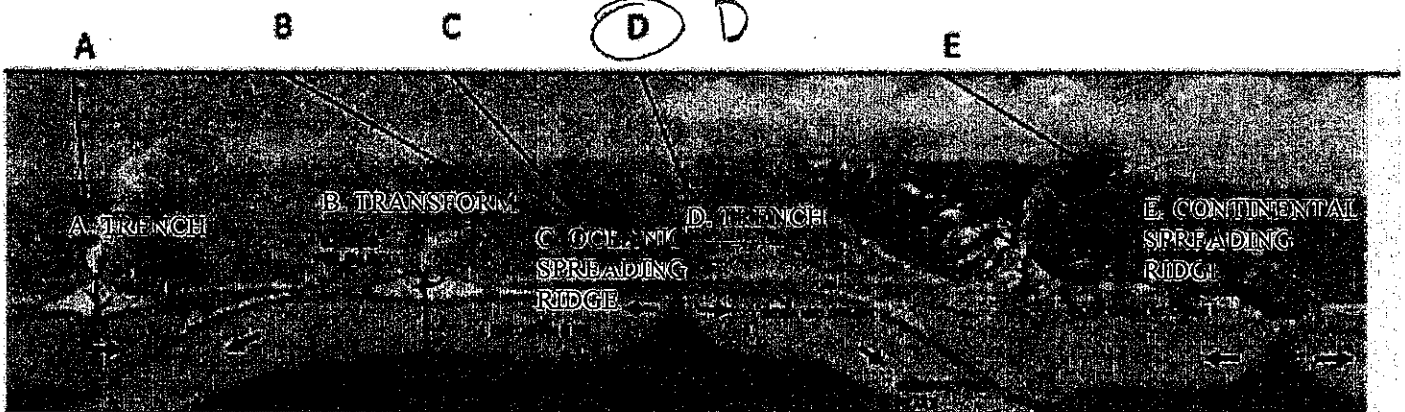
ISP 203A: GLOBAL CHANGE  
EXAM #2; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A39737915; GROUP #: T

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- D 1. At which boundary is the ocean likely to be deepest?



- a 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

\* ☒ a. Continental crust does not melt very well at convergent boundaries.  
b. Continental crust is so thick that melt cools before it reaches the surface.  
c. Continental crust overlies mantle that is too cold for much melting to occur.

- ! 3. Which of these carries the most material in streams?

\* a. Dissolved load  
b. Suspended load  
☒ c. Bed load

α credit

- a 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

a ☒ a. A = compaction, B = oxidation, C = photosynthesis  
b. A = burial, B = respiration, C = weathering  
- c. A = burial, B = oxidation, c = photosynthesis  
d. A = compaction, B = degassing, c = photosynthesis

- C 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

a ☒ a. Ocean-continent transform-boundary  
b. Ocean-ocean divergent boundary  
c. Continent-ocean convergent boundary

- b 6. Why do continents never subduct under oceans?

☒ a. Continental rocks are less dense than oceanic rocks.  
b. Oceanic rocks are less dense than continental rocks.  
c. Continental rocks are warmer than oceanic rocks.  
d. Oceanic rocks are warmer than continental rocks.

4a  
answer: d

STUDENT ID #: \_\_\_\_\_ GROUP #: \_\_\_\_\_

- C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0

- b 8. What type of energy drives slab pull?
- ☐ a. Gravitational energy
  - ☒ b. Thermal energy
  - c. Chemical energy

- d 9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.

temp, comp, pressure  $\Delta$  density

- b 10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- a ☒ a. Magma erupting and a hot air balloon rising
- b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A:

Magma erupting and a hot air balloon rising because they both involve the release of gas and are driven by thermal energy.

C B. Which of the following are most similar?

- a. Photosynthesis and respiration
- b. Photosynthesis and burning coal
- ☒ c. Respiration and burning coal

Please explain your response to B:

Respiration and burning of coal, both go through the process of oxidation

STUDENT ID #: A39737915 ~~XXXXXX~~; GROUP #: T

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

a. The earthquake in Japan had a magnitude of 9, while the earthquake in Haiti had a magnitude of 7.

b. An earthquake is a release of energy beneath the Earth's surface and the magnitude measures this energy. If the fault that causes the earthquake breaks through the ocean crust, the crust will be pushed vertically. This will then push the ocean water vertically, displacing it, causing a tsunami like the one in Japan.

The earthquake in Haiti killed 200,000 to 300,000 people. The earthquake in Japan had a much lower death toll. In Japan there are strict building codes, which are enforced in defense of earthquakes. Buildings are built on a layer of concrete, which is on a layer of springs, which is on another layer of concrete. This serves as a shock absorber. In Japan, buildings are also made of steel because it can bend and move with the earthquake. Regulations such as these are not enforced in Haiti, where most buildings are made of concrete because it is cheap, but the concrete buildings crumble easily in the event of an earthquake. There is also no alarm system in Haiti, whereas in Japan, the people are notified of an upcoming earthquake and are given 8 minutes to find a safe place.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- a. An explanation of buoyancy.
- b. Description of why buoyancy changes as a magma rises.

Magma is melted rock, which has melted at a plate boundary due to the addition of water from the subducting plate, combined with the right temperature and pressure.

- a. Buoyancy is the movement of materials due to differences in density. More dense things have a tendency to be pulled stronger to the Earth center due to gravity, than less dense materials. Liquids are less dense than solids and warmer materials are generally less dense than cooler materials, causing them to rise. Temperature, composition and pressure affect the density of an object or material.
- b. Once magma is formed (when the rock is melted) it becomes less dense than the surrounding asthenosphere. It begins to rise quickly because it is much less dense and it is warmer. As it travels towards the earth's surface it begins to slow. It releases some gas and also is cooled by the surrounding asthenosphere. The magma warms the solid rock making it easy to push through. The solid rock cools the magma, so the magma slows but does not stop moving, even if all of the gas is released, because it is still a liquid, meaning that it is still less dense than the solid rock. So the speed of the rising magma slows, but does not cease.

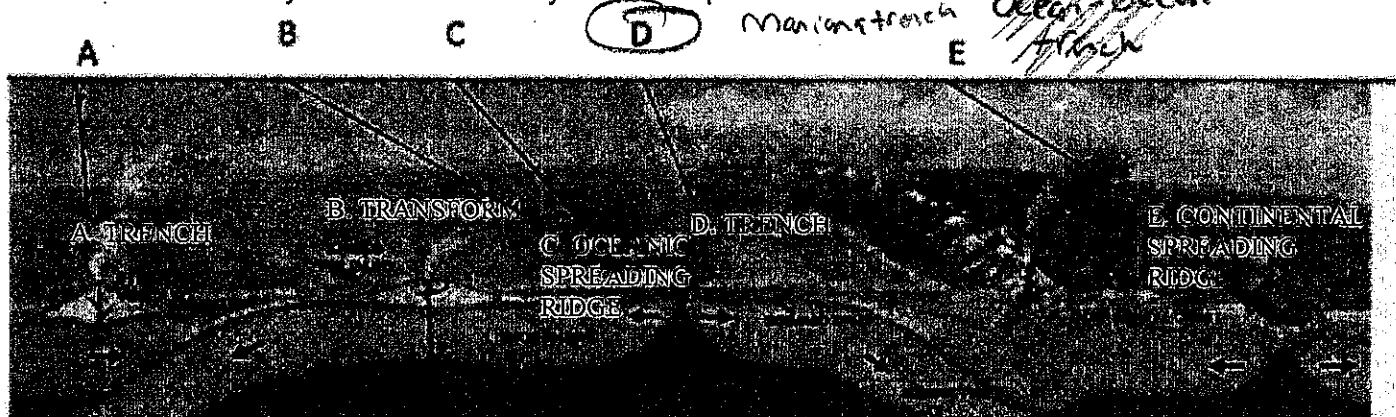
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?



STUDENT ID #: A43012134 SK; GROUP #: X

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?

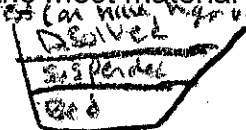


2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- ☒ a. Dissolved load
- b. Suspended load
- c. Bed load



There is no subducting plate to change the chemical composition of the mantle to cause it heat become less dense and rise up until it is cooled

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis
- ☒ b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, c = photosynthesis
- d. A = compaction, B = degassing, c = photosynthesis

#4A: A

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- ☒ c. Continent-ocean convergent boundary

Slow velocity when hits water and things settle

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.
- b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

I feel this is not a very good question, for the choices we have

STUDENT ID #: A43012134 GROUP #: X

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- a. 7.0
- b. 8.0
- ☒ c. 9.0
- d. 10.0

8. What type of energy drives slab pull?

- ☒ a. Gravitational energy
- b. Thermal energy
- c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- a. Buoyancy will occur when two materials of differing temperature interact.
- b. Buoyancy will occur when two materials of differing structure interact.
- c. Buoyancy will occur when two materials of differing phase interact.
- ☒ d. Buoyancy will occur when two materials of differing density interact.
- e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- a. The movement of seismic waves through water
- ☒ b. The undersea displacement of water
- ~~c. The heating of water during an earthquake~~

P wave: |---|

S wave: ~~~~~

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising
- b. Magma erupting and an airplane lifting off
- c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

When magma reacts with water it composition changes making it less dense and rises up. Similarly in a hot air balloon, molecules are heated making them less dense and the balloon begins to rise.

B. Which of the following are most similar?

- a. Photosynthesis and respiration
- b. Photosynthesis and burning coal
- ☒ c. Respiration and burning coal

Please explain your response to B.:

I think this was in a lecture from a while ago... so that's why I picked it

STUDENT ID #: A430121341 ; GROUP #: X

SHORT ANSWER. 25 points each (50 points total)

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

(A)  $\rightarrow$  Haiti:  $\approx$  7 magnitude  
Japan:  $\approx$  9 magnitude

(B) Haiti - poor, builds cement keeps houses  
- no alert system  
Japan - rich, to build w/ steel & springs  
- alert system

The earthquake in Haiti was about 7 the earthquake in Japan was about 9, the reason Haiti was more deadly was because of infrastructure. Haiti is a poor country that makes its buildings of cement, which is not as bendable as steel, which makes up buildings in Japan. Also in Japan some buildings are built on springs which help reduce the damage of earthquakes, because Haiti is a poor country buildings are not designed as well as Japan's to withstand great magnitudes.

STUDENT ID #: ALB012134; GROUP #: X

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy is the change in density that allows something to rise (less dense) or sink (more dense). As magma rises it becomes cooler making it more dense and therefore it becomes less buoyant.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

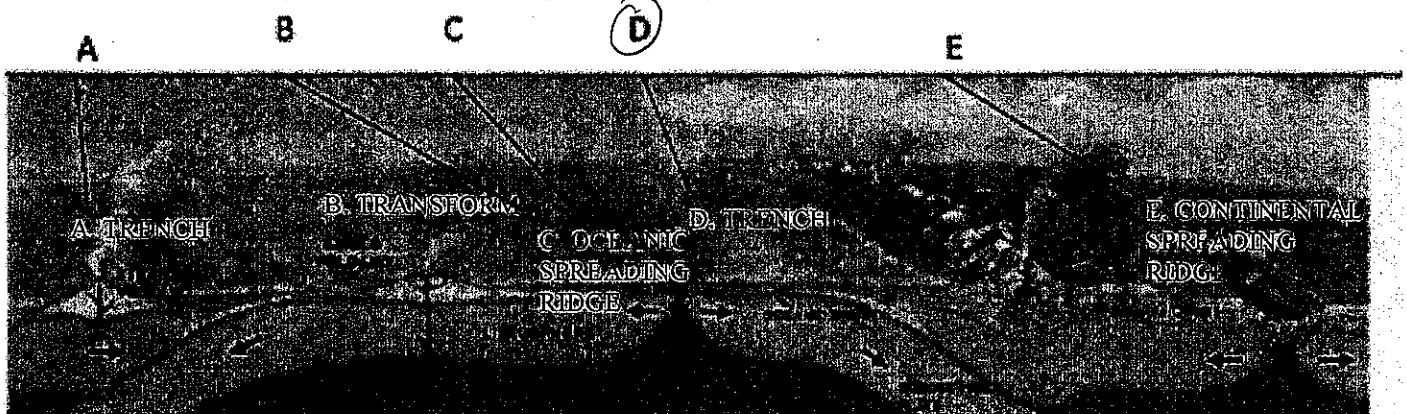
1. The structures weren't meant for as big of an earthquake that came through.

2. The tsunami's water created an issue for the rods in the <sup>reactor</sup> <sub>core</sub>.

STUDENT ID #: A42480810; GROUP #: X

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

a. Continental crust does not melt very well at convergent boundaries.  
b. Continental crust is so thick that melt cools before it reaches the surface.  
c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

a. Dissolved load  
b. Suspended load  
c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

a. A = compaction, B = oxidation, C = photosynthesis  
b. A = burial, B = respiration, C = weathering  
c. A = burial, B = oxidation, C = photosynthesis  
d. A = compaction, B = degassing, C = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

a. Ocean-continent transform boundary  
b. Ocean-ocean divergent boundary  
c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

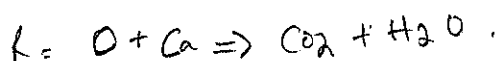
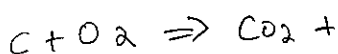
a. Continental rocks are less dense than oceanic rocks.  
b. Oceanic rocks are less dense than continental rocks.  
c. Continental rocks are warmer than oceanic rocks.  
d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A42480810; GROUP #: \_\_\_\_\_

- C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
- A 8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
- D 9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
- A 10. Which of the following can cause a tsunami?
- ☒ a. The movement of seismic waves through water
  - b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off



Please explain your response to A.:  
Both rely on convection and buoyancy. Since both are heated, expand upon heating, become less dense than the surrounding air & mantle, and rise to the top where they cool off.

- B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:  
Both respiration and burning coal use oxygen and carbon and give off carbon dioxide.

Q4A) D

STUDENT ID #: AU2480810; GROUP #: X

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Japanese earthquake was higher in magnitude than the earthquake in Haiti, however, it still caused greater damage in Haiti. The primary reason is Haiti's infrastructure & socioeconomic status. Haiti is one of the poorest countries in the world while Japan is one of the wealthiest. Haiti's infrastructure ~~to~~ was never developed ~~to~~ withstand disasters like earthquakes, while Japan's was. Japan, located on the Pacific Ring of fire, ~~are~~ built their infrastructure using materials that would withstand earthquakes. Furthermore, Japan has prepared its people through warning signals, emergency drills, education, search and rescue <sup>teams</sup> and has the medical facilities in place to deal with such high casualties. All these factors mentioned are sorely lacking in Haiti - a country whose people live on less than a dollar a day, don't have access to basic healthcare, permanent shelter, ~~or~~ proper education, sanitation and food.

STUDENT ID #: A42480810; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy is the interaction of two materials with different densities. The less dense material will float in a denser material. As the mantle rocks melt due to heat from the mantle, they are pushed upward since they become less and less dense due to the heat. The less dense magma is forced upward by the denser mantle until it moves towards the surface where it cools off and solidifies.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

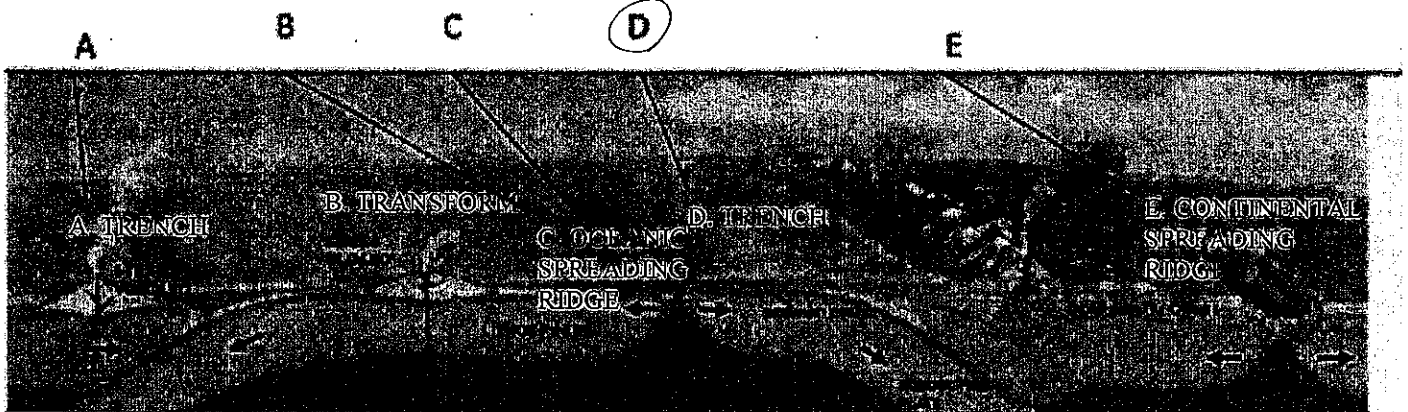
The first reason is that the Nuclear power plant was built for a 7.0 magnitude earthquake.



STUDENT ID #: A43398594; GROUP #: X

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

- D 1. At which boundary is the ocean likely to be deepest?



- A 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?
- a. Continental crust does not melt very well at convergent boundaries.
  - b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

- B 3. Which of these carries the most material in streams?
- a. Dissolved load
  - b. Suspended load
  - c. Bed load

- A 4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- d. A = compaction, B = degassing, C = photosynthesis

(4a) D

- C 5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - c. Continent-ocean convergent boundary

- A 6. Why do continents never subduct under oceans?
- a. Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A43398594; GROUP #: X

- C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0

- A 8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy

- D 9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.

- B 10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
As both become hotter it rises, becoming less dense and cools as it gets higher up.

- B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:  
Both release some type of chemical back into the atmosphere.

STUDENT ID #: A43398594; GROUP #: X

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Haiti earthquake had a magnitude of 7 while Japan had a magnitude of 9. Haitian earthquake was deadlier than Japan's because of the economy and environmental factors. Haiti wasn't rich as Japan therefore could not afford the materials. The buildings were made out of cement & couldn't withstand the earthquake while Japan's buildings were made of steel and had springs which were much more bendable. Therefore, it resulted more deaths in Haiti than Japan.

STUDENT ID #: A43398594; GROUP #: X

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy is comparing the relative density of one material to another. As magma rises in temperature, it becomes more buoyant because it is less dense than its surrounding area. As it moves further up to Earth's surface, the magma cools down slowing its ascent. The magma may still be more buoyant and continue to rise a little more until it becomes the same density or settle above Earth's surface.

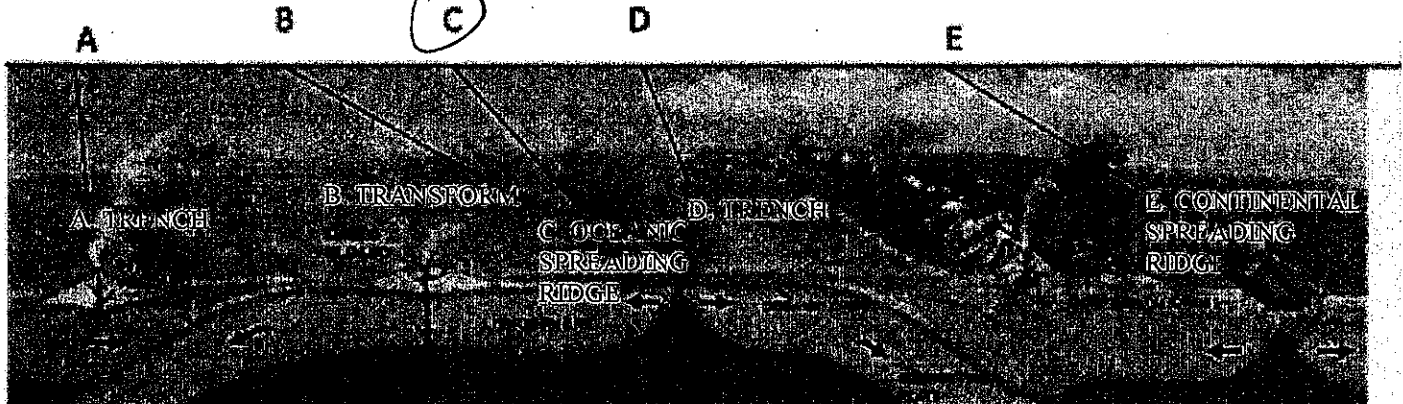
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

The nuclear power plant wasn't built to withstand that high amount of magnitude of the Earthquake.

STUDENT ID #: A31630993; GROUP #: X

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

☒ a. Continental crust does not melt very well at convergent boundaries.  
b. Continental crust is so thick that melt cools before it reaches the surface.  
c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

a. Dissolved load  
☒ b. Suspended load  
c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

☒ a. A = compaction, B = oxidation, C = photosynthesis  
b. A = burial, B = respiration, C = weathering  
c. A = burial, B = oxidation, C = photosynthesis  
d. A = compaction, B = degassing, C = photosynthesis

4A.) A

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

☒ a. Ocean-continent transform boundary  
b. Ocean-ocean divergent boundary  
c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

☒ a. Continental rocks are less dense than oceanic rocks.  
b. Oceanic rocks are less dense than continental rocks.  
c. Continental rocks are warmer than oceanic rocks.  
d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A31630993; GROUP #: X

- C 7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0
- 18 8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
- D 9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
- B 10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:  
because like a hot air balloon  
the hot magma rises because it is  
less dense. Just like the hot air in  
a balloon rises

- C B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:  
both processes use oxygen and  
their end product is CO<sub>2</sub> gas.

STUDENT ID #: A31630943; GROUP #: X

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

Although the magnitude of the earthquake in Haiti was not as strong as the Japanese quake it effected Haiti more greatly.

Haiti is a far less developed country than Japan and although the Haitian quake was not a 9 like the Japanese quake the under developed concrete buildings of Haiti could not handle the quake well. Japanese buildings have metal infrastructure on their building which withstood the quake force better. Even though the Haitian quake was only 7's it effected the poorer country greater than Japan.

STUDENT ID #: A31630993; GROUP #: X

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

④ Buoyancy is the act of 2 materials of different density interact. Hotter less dense materials rise above colder more dense material. As magma forms it is less dense than the surrounding rocks and rises toward the surface.

⑥ Buoyancy changes as magma rises because as the magma moves upward the gases in the magma degas. This makes the magma less dense but the heat of the magma makes the surrounding rock softer without its heat so the magma continues to rise, only slower.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

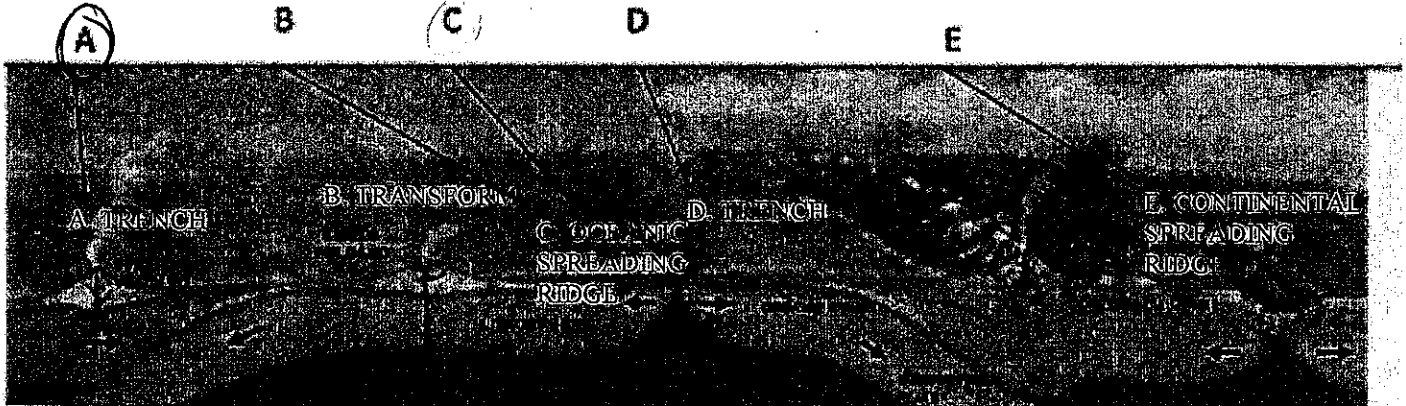
- ① The plant was only made to withstand a 7.9 quake.
- ② It was built too close the shore line.



STUDENT ID #: A42177911; GROUP #: Y

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest?



- B 2. Why does very little volcanic activity occur at continent-continent convergent boundaries?
- a. Continental crust does not melt very well at convergent boundaries.
  - ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
  - c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- B ☒ a. Dissolved load  
☐ b. Suspended load  
c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- C ☐ a. A = compaction, B = oxidation, C = photosynthesis  
☐ b. A = burial, B = respiration, C = weathering  
☒ c. A = burial, B = oxidation, C = photosynthesis  
☐ d. A = compaction, B = degassing, C = photosynthesis

4A A

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- C ☐ a. Ocean-continent transform boundary  
☐ b. Ocean-ocean divergent boundary  
☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- B ☐ a. Continental rocks are less dense than oceanic rocks.  
☒ b. Oceanic rocks are less dense than continental rocks.  
☐ c. Continental rocks are warmer than oceanic rocks.  
☐ d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A42177911; GROUP #: Y

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- C  
a. 7.0  
b. 8.0  
☒ c. 9.0  
d. 10.0

8. What type of energy drives slab pull?

- A  
☒ a. Gravitational energy  
b. Thermal energy  
c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- D  
☒ a. Buoyancy will occur when two materials of differing temperature interact.  
~~b. Buoyancy will occur when two materials of differing structure interact.~~  
~~c. Buoyancy will occur when two materials of differing phase interact.~~  
☒ d. Buoyancy will occur when two materials of differing density interact.  
e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- B  
a. The movement of seismic waves through water  
☒ b. The undersea displacement of water  
~~c. The heating of water during an earthquake~~

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- A  
☒ a. Magma erupting and a hot air balloon rising  
b. Magma erupting and an airplane lifting off  
~~c. A hot balloon rising and an airplane lifting off~~

Please explain your response to A.:

Magma rises as it de-gases, much like a hot air balloon rises through the pressure + heat of gas

B. Which of the following are most similar?

- C  
~~a. Photosynthesis and respiration~~  
b. Photosynthesis and burning coal  
☒ c. Respiration and burning coal

Please explain your response to B.:

Both burning coal + respiration release CO<sub>2</sub> into the atmosphere

STUDENT ID #: A42177911; GROUP #: Y

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The earthquake within this year caused a tsunami over Japan. The tsunami occurred through the vertical wave which swept over the land, produced by the fault reaching the ocean floor. Although the Japan earthquake was higher in comparison to the Haitian earthquake, socioeconomic + environmental factors played a large role in amount of casualties. Because Japan is more industrialized and wealthier than Haiti, they were able to find disaster relief in more effective ways. Overall, both earthquakes had a devastating effect on their countries.

STUDENT ID #: A42177911; GROUP #: V

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

As magma rises to the surface, the buoyancy of that magma changes. Buoyancy allows for the magma to rise or fall depending on its surroundings, therefore, as the magma rises, and the surroundings change, so does the buoyancy. As magma rises it begins to cool, and harden. This also factors into buoyancy as the more compact the magma becomes, the less dense it becomes. Overall, the change in surrounding change in magma structure and change in pressure allow for the change in buoyancy.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

hotter, less dense  
cooler, more dense  
more molecules more dense

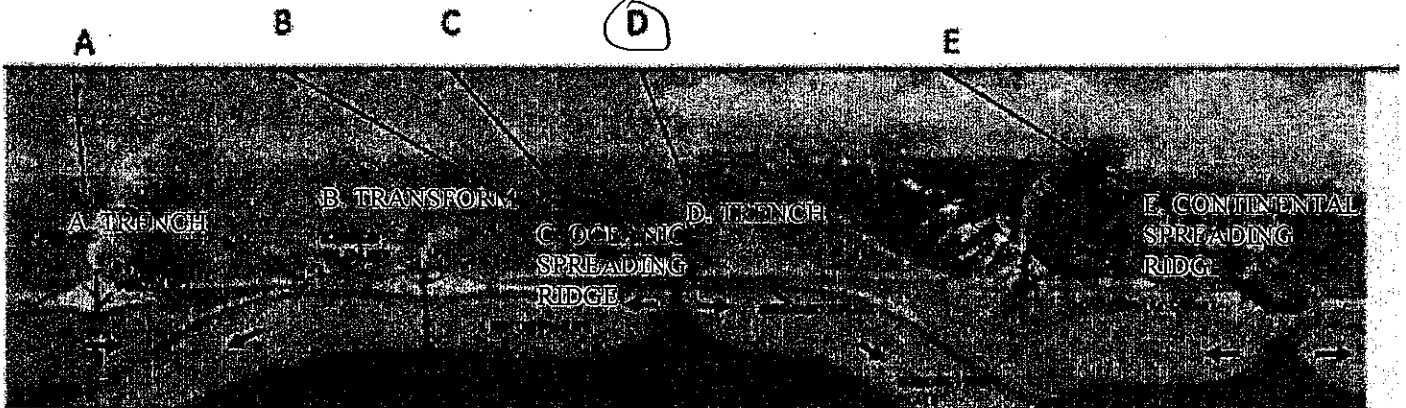
ISP 203A: GLOBAL CHANGE  
EXAM #2; Sibley/Libarkin, Spring 2011; 100 points

1

STUDENT ID #: A40491423; GROUP #: V

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest? D



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- C
- a. Continental crust does not melt very well at convergent boundaries.
  - b. Continental crust is so thick that melt cools before it reaches the surface.
  - c Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- B
- a. Dissolved load
  - b Suspended load
  - c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- IA = A
- a. A = compaction, B = oxidation, C = photosynthesis
  - b A = burial, B = respiration, C = weathering
  - c. A = burial, B = oxidation, c = photosynthesis
  - d. A = compaction, B = degassing, c = photosynthesis

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- C
- a. Ocean-continent transform boundary
  - b. Ocean-ocean divergent boundary
  - c Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- A
- a Continental rocks are less dense than oceanic rocks.
  - b. Oceanic rocks are less dense than continental rocks.
  - c. Continental rocks are warmer than oceanic rocks.
  - d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- C
- a. 7.0
  - b. 8.0
  - ☒ c. 9.0
  - d. 10.0

8. What type of energy drives slab pull?

- A
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy

9. Which of the following is the most general correct explanation of buoyancy?

- D
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- B
- ☒ a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising
- ☒ b. Magma erupting and an airplane lifting off
- c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

Both represent the reactions of less dense materials rising.

B. Which of the following are most similar?

- a. Photosynthesis and respiration
- b. Photosynthesis and burning coal
- ☒ c. Respiration and burning coal

Please explain your response to B.:

Both release chemicals into the atmosphere.

STUDENT ID #: A40491423; GROUP #: V

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

While the earthquake in Japan was of approximately 9.0 magnitude, compared to an approximate magnitude of 7.0 earthquake in Haiti, the death tolls were much higher in Haiti. The main factor was what materials the buildings were constructed out of. Japan rebuilt their buildings after they were bombed in the 1940's and reconstructed them out of steel. On the other hand, the buildings in Haiti were made of concrete. With concrete being far easier for an earthquake to destroy, the earthquake that hit Haiti was much more devastating.

STUDENT ID #: \_\_\_\_\_; GROUP #: \_\_\_\_\_

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- asthenosphere*
- An explanation of buoyancy.
  - Description of why buoyancy changes as a magma rises.

Buoyancy occurs when two materials of differing density interact. The less dense material will rise above the more dense material. As magma rises towards the Earth's surface, the magma becomes less dense. The buoyant force acting on a rising magma is the force of the asthenosphere, which is more dense than the magma. Since the Earth's surface is more dense than the magma, the magma rises. When magma is not rising but at a standstill, the buoyancy will not change. But as the magma rises, the buoyancy of the Earth's surface versus magma causes magma to rise.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

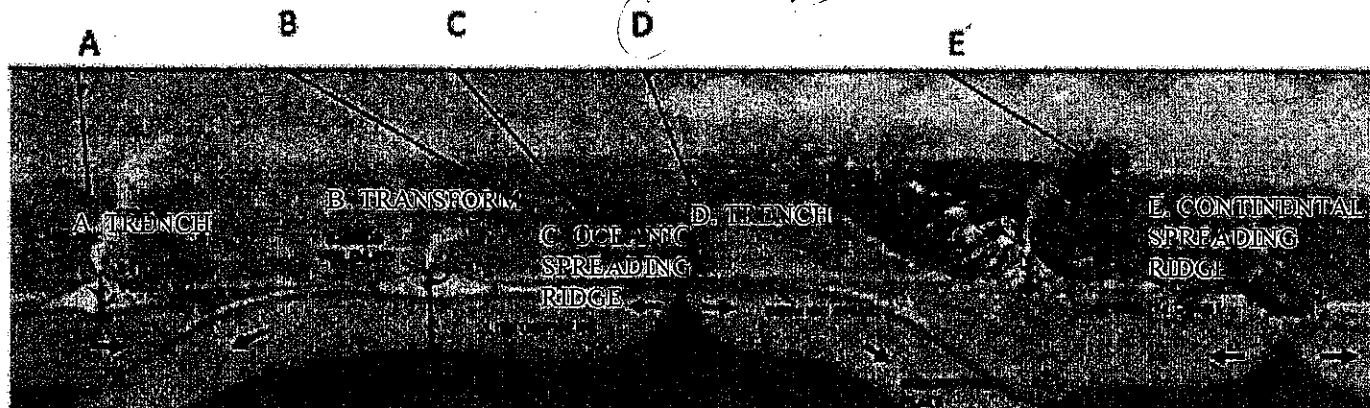
- The parts of the nuclear power plant that were supposed to be kept cold could not be once the power went out. With overheating, the power plant was that much closer to self destruction.



STUDENT ID #: A37417357; GROUP #: Y

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest? E



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- a. Continental crust does not melt very well at convergent boundaries.
- ☒ b. Continental crust is so thick that melt cools before it reaches the surface.
- c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- a. Dissolved load
- ☒ b. Suspended load
- c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- a. A = compaction, B = oxidation, C = photosynthesis
- b. A = burial, B = respiration, C = weathering
- c. A = burial, B = oxidation, C = photosynthesis
- ☒ d. A = compaction, B = degassing, C = photosynthesis

4A) C

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- ☒ a. Ocean-continent transform boundary
- b. Ocean-ocean divergent boundary
- c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- a. Continental rocks are less dense than oceanic rocks.
- ☒ b. Oceanic rocks are less dense than continental rocks.
- c. Continental rocks are warmer than oceanic rocks.
- d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A37417357; GROUP #: Y

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?
- a. 7.0
  - ☒ b. 8.0
  - c. 9.0
  - d. 10.0
8. What type of energy drives slab pull?
- ☒ a. Gravitational energy
  - b. Thermal energy
  - c. Chemical energy
9. Which of the following is the most general correct explanation of buoyancy?
- a. Buoyancy will occur when two materials of differing temperature interact.
  - b. Buoyancy will occur when two materials of differing structure interact.
  - c. Buoyancy will occur when two materials of differing phase interact.
  - ☒ d. Buoyancy will occur when two materials of differing density interact.
  - e. Buoyancy will occur when two materials of differing composition interact.
10. Which of the following can cause a tsunami?
- a. The movement of seismic waves through water
  - ☒ b. The undersea displacement of water
  - c. The heating of water during an earthquake

EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

- A. Which of the following are most similar?
- ☒ a. Magma erupting and a hot air balloon rising
  - b. Magma erupting and an airplane lifting off
  - c. A hot balloon rising and an airplane lifting off

Please explain your response to A.:

As the air (magma) gets hotter it starts to rise.

- B. Which of the following are most similar?
- a. Photosynthesis and respiration
  - b. Photosynthesis and burning coal
  - ☒ c. Respiration and burning coal

Please explain your response to B.:

They both make CO<sub>2</sub> in the

STUDENT ID #: A37417357; GROUP #: Y

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
- A discussion of the approximate magnitudes of each earthquake
  - A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Haitian earthquake was deadlier because it was a great magnitude closer to the top of the land. The Japan earthquake struck more towards the middle which was closer underwater which is why the tsunami occurred it caused the water to be displaced and the the water went vertical. There was no tsunami in Haiti.

STUDENT ID #: A37417357; GROUP #: Y

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

The buoyancy occurs because of the temperature change causing heat to rise making the magma rise which will then cause it to erupt. The buoyancy then has the cooler part being forced down causing heat to rise meaning the magma starts to rise.

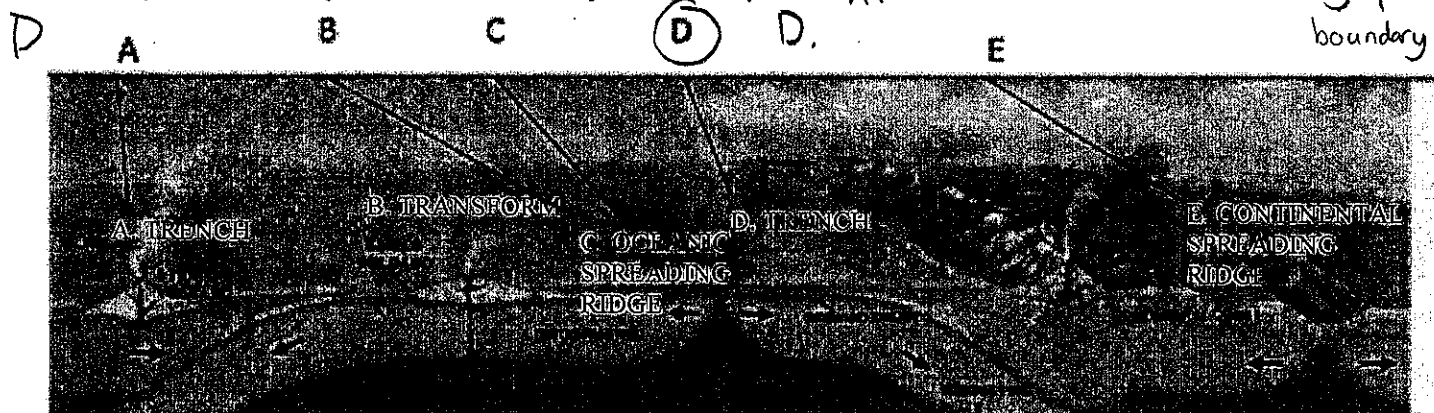
EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?

- They did not consider that the earthquake would cause the gas to mix making it unstable.
- They aren't able to control the gases hence more leaks out.

STUDENT ID #: A35919773; GROUP #: Y

MULTIPLE CHOICE. 5 points each (50 points total). Please choose the BEST answer.

1. At which boundary is the ocean likely to be deepest? At ocean-continental subducting plates



2. Why does very little volcanic activity occur at continent-continent convergent boundaries?

- ☐ a. Continental crust does not melt very well at convergent boundaries.  
☐ b. Continental crust is so thick that melt cools before it reaches the surface.  
☒ c. Continental crust overlies mantle that is too cold for much melting to occur.

3. Which of these carries the most material in streams?

- ☐ a. Dissolved load  
☒ b. Suspended load  
☐ c. Bed load

4. Fill in the blanks. Carbon in sediment becomes carbon in sedimentary rock through the process of A, then becomes carbon in the atmosphere through the process of B, and then becomes carbon in plants through the process of C.

- ☒ a. A = compaction, B = oxidation, C = photosynthesis  
☐ b. A = burial, B = respiration, C = weathering  
☐ c. A = burial, B = oxidation, C = photosynthesis  
☐ d. A = compaction, B = degassing, C = photosynthesis

4a.

5. At which type of boundary is one most likely to find igneous, sedimentary, and metamorphic rocks?

- ☐ a. Ocean-continent transform boundary  
☐ b. Ocean-ocean divergent boundary  
☒ c. Continent-ocean convergent boundary

6. Why do continents never subduct under oceans?

- ☒ a. Continental rocks are less dense than oceanic rocks.  
☐ b. Oceanic rocks are less dense than continental rocks.  
☐ c. Continental rocks are warmer than oceanic rocks.  
☐ d. Oceanic rocks are warmer than continental rocks.

STUDENT ID #: A 35919773; GROUP #: Y

7. What was the magnitude of the earthquake that occurred off the coast of Japan on March 11, 2011?

- a. 7.0
- b. 8.0
- ☒ c. 9.0
- d. 10.0

8. What type of energy drives slab pull?

- a. Gravitational energy
- ☒ b. Thermal energy
- c. Chemical energy

warmer  
cooler

9. Which of the following is the most general correct explanation of buoyancy?

- a. Buoyancy will occur when two materials of differing temperature interact.
- b. Buoyancy will occur when two materials of differing structure interact.
- c. Buoyancy will occur when two materials of differing phase interact.
- ☒ d. Buoyancy will occur when two materials of differing density interact.
- e. Buoyancy will occur when two materials of differing composition interact.

10. Which of the following can cause a tsunami?

- a. The movement of seismic waves through water
- ☒ b. The undersea displacement of water
- c. The heating of water during an earthquake



EXTRA CREDIT (5 points). You will receive full credit for choosing a response and providing a short explanation for both questions.

A. Which of the following are most similar?

- ☒ a. Magma erupting and a hot air balloon rising
- b. Magma erupting and an airplane lifting off
- c. A hot balloon rising and an airplane lifting off

Please explain your response to A.: Both are driven by buoyancy, and do so by heat rising from the bottom.

B. Which of the following are most similar?

- a. Photosynthesis and respiration
- b. Photosynthesis and burning coal
- ☒ c. Respiration and burning coal

Please explain your response to B.: Both 'excrete' carbon dioxide.

STUDENT ID #: A 35919773; GROUP #: Y

**SHORT ANSWER. 25 points each (50 points total)**

1. The March 11, 2011 earthquake in Japan killed many fewer people than the Haitian earthquake that occurred on Jan. 12, 2010. **Explain why** the Haitian earthquake was much deadlier than the Japanese earthquake. Your explanation must include:
  - a. A discussion of the approximate magnitudes of each earthquake
  - b. A discussion of the socioeconomic and environmental factors that contributed to the relative difference in death tolls.

The Haitian earthquake was about 100 times weaker than the Japanese earthquake (7 vs. a 9). However, based on the 'new-ness' of Japanese structures, they were able to survive better. Buildings in Haiti were made out of concrete, which does not hold up structurally as well as the concrete buildings in Japan, while under the force of an earthquake. Additionally, Japanese buildings were built on 'better' bases, which use slabs and springs to absorb the energy from the earthquakes, Japan was able to do these things because they had access to the appropriate materials, could afford it, and built their structures in a relatively new time in comparison to Haiti.

STUDENT ID #: A35919773; GROUP #: Y

2. Explain how the buoyant force on a rising magma changes as the magma rises towards the Earth's surface. Your explanation must include:

- An explanation of buoyancy.
- Description of why buoyancy changes as a magma rises.

Buoyancy is the rising of a less dense material through a more dense material. As magma is formed, it is much less dense than the surrounding (continental) lithosphere. Because of the lithosphere being less dense, and there being cracks for the magma to fit through, magma can rise. There is not always a path for magma to take, based on how much cracking has taken place in the lithosphere due to collisions with the other converging plate, and based on how much magma has melted the lithosphere above it, so it doesn't always rise to the surface. The buoyancy of magma changes as it rises because it goes further away from the hotter asthenosphere, and cools as it comes in contact with the cooler lithosphere, causing an increase in magma density.

EXTRA CREDIT (2 points). Nuclear power plants are built with natural hazards and other potential problems in mind. What are two reasons for why the nuclear power plant in Japan failed to withstand the recent earthquake?